

CHAPTER 3: COMMENT SUMMARIES AND RESPONSES

This chapter summarizes the comments the U.S. Department of Energy (DOE) received on the *Draft Site-wide Environmental Impact Statement for Continued Operation of Lawrence Livermore National Laboratory and Supplemental Stockpile Stewardship and Management Programmatic Environmental Impact Statement* (LLNL SW/SPEIS) during the public comment period, and provides responses to those comments. Identical or similar comments provided by more than one commentor are grouped together in one comment summary for response. The responses indicate whether any changes were made to the LLNL SW/SPEIS and the rationale behind those decisions. Section 1.3 describes the organization of this Comment Response Document and discusses the tables provided in Chapter 1 to assist readers in tracking their comments to the respective comment summary and response.

01 POLICY

01.01 Many commentors were concerned that the DOE was not in compliance with Article VI of the Nuclear Nonproliferation Treaty (NPT), which obligates the parties “to pursue negotiations in good faith on effective measures relating to cessation of nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.” Commentors requested that a nonproliferation and treaty compliance review be conducted for the activities covered in the LLNL SW/SPEIS, including the National Ignition Facility (NIF) and the Integrated Technology Project (ITP). Some commentors expressed the opinion that the Nuclear Posture Review cannot be used to justify the Proposed Action because its findings are contrary to international law and treaty agreements.

Response: *As indicated in Chapter 1 of the LLNL SW/SPEIS, LLNL is responsible for maintaining the safety, security, and reliability of the Nation’s nuclear stockpile as part of the NNSA’s Stockpile Stewardship Program (SSP). LLNL is responsible for surveillance of several weapons systems currently in the stockpile. The nonproliferation and treaty compliance aspects of the SSP were previously evaluated in the Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management (SSM PEIS) (DOE 1996a). This work remains relevant.*

Chapter 2 of the SSM PEIS provides a review of relevant treaties, discusses the nonproliferation aspects of the SSP, and states that implementation of the SSP would not lead to proliferation. The SSM PEIS states, “The loss of confidence in the safety or reliability of the weapons in the U.S. stockpile could result in a corresponding loss of credibility of the U.S. nuclear deterrent and could provide an incentive to other nations to develop their own nuclear weapons programs.”

With specific respect to Article VI of the NPT, as explained in the SSM PEIS, “Stockpile Stewardship contributes positively to U.S. arms control and nonproliferation policy...by providing the United States with continued confidence in its weapons to allow for further reductions and to meet its NPT obligations.” DOE/National Nuclear Security Administration (NNSA) has concluded that this remains true. In addition, the jointly

submitted report to Congress by the Secretary of State, Secretary of Defense, and Secretary of Energy in March 2004, entitled, “An Assessment of the Impact of Repeal of the Prohibition on Low Yield Warhead Development on the Ability of the United States to Achieve Its Nonproliferation Objectives” (Secretary of State 2004) provides additional information regarding U.S. compliance with its commitment under Article VI of the NPT.

The SSM PEIS Record of Decision (ROD) (61 FR 68014) indicates that the decisions made in the ROD “...will help enable the NNSA to assess and certify the safety and reliability of the Nation’s nuclear weapons stockpile. The September 2002 DOE Strategic Plan also provides information on stockpile stewardship and nuclear arms control and nonproliferation. As stated in the Strategic Plan, “The Stockpile Stewardship Program is carried out in full consonance with and supportive of START agreements and other nuclear nonproliferation initiatives.”

Therefore, the treaty and nonproliferation aspects of the SSP at LLNL have been evaluated in several DOE documents. The activities identified as a part of the Proposed Action in the LLNL SW/SPEIS are consistent with LLNL’s SSP mission. As a result, these activities do not affect the United States’ continued compliance with arms control treaties including the NPT. Information has been added to Chapter 1, Section 1.3.1 of the LLNL SW/SPEIS that further addresses these issues. The issues of treaty compliance and nonproliferation will be considered, as appropriate, by the DOE decisionmakers in the ROD for the continued operation of LLNL.

As indicated in Section 1.3.1, the Nuclear Posture Review establishes direction for nuclear forces for the next 5 to 10 years. The purpose and need of the LLNL SW/SPEIS is consistent with, and supportive of, the Nuclear Posture Review. NNSA disagrees with the opinion that the Nuclear Posture Review, which is discussed in Section 1.3.2 of the LLNL SW/SPEIS, is contrary to international law and treaty agreements.

NIF is an integral part of the SSP and as such is considered during the review for treaty compliance and nonproliferation aspects of the SSP. Appendix I of the SSM PEIS provided an evaluation of the construction and operation of the NIF. As indicated in Chapter 1 of Appendix I, one of the objectives of the SSP is “Ensurance that the activities needed to maintain the Nation’s nuclear deterrent are consistent with the Nation’s arms control and nonproliferation objectives.” Nonproliferation was evaluated for NIF in a study The National Ignition Facility and the Issue of Nonproliferation (DOE 1995b). The study, prepared by the DOE Office of Nonproliferation and National Security, concluded that (1) the technical proliferation concerns at NIF are manageable and therefore can be made acceptable, and (2) NIF can contribute positively to U.S. arms control and nonproliferation policy goals. NNSA has determined that the use of fissile material, fissionable material, and lithium hydride in NIF experiments as detailed in Appendix M of the LLNL SW/SPEIS does not change these conclusions. This information has been added to Appendix M, Section M.1.1.1 that addresses this issue. NNSA has reconsidered its requirements and determined that there is no reasonably foreseeable need to pursue either the Advanced Material Program (AMP) or the ITP. Therefore, the AMP has been removed from the No Action Alternative, the ITP has been removed from the Proposed

Action, and the information in Appendix N has been removed. Therefore, a review of the treaty compliance and nonproliferation aspect of ITP is no longer relevant.

- 01.02** Commentors questioned if the proposed BioSafety Level-3 (BSL-3) Facility would be in violation of international biological weapons treaties. According to these commentors, placement of a BSL-3 Facility within LLNL will raise suspicions among other nations and could potentially catalyze a new biological arms race, or complicate possible enforcement and verification protocols. Commentors requested that a nonproliferation and treaty compliance review be conducted for the proposed BSL-3 Facility.

Response: *The United States is a signatory to the Biological and Toxin Weapons Convention (BWC), which prohibits the development and production of bioweapons. The BWC does not prohibit activities with biological agents which are for prophylactic, protective or other peaceful purposes. The BSL-3 Facility would be consistent with the BWC as its activities will conform with treaty obligations. As noted in Appendix A, Section A.2.3.2, the facility is designed to accommodate work on detection and counter-terrorism technologies, and will provide for environmentally safe and physically secure manipulation and storage of infectious micro-organisms. The BSL-3 Facility will develop DNA signatures to rapidly identify deadly agents, a capability that could be used to protect the public in response to a bio-terrorism incident. The BSL-3 Facility operation does not combine biological research with nuclear weapons activities. Genetic modification activities would be used for studying how to weaken an agent, not to make it more robust.*

- 01.03** Commentors stated that the United States should reduce the current size of the nuclear weapons stockpile. Commentors expressed concern regarding the number of nuclear weapons that LLNL has designed for the “enduring” stockpile.

Response: *With respect to reducing the size of the nuclear weapons stockpile, the President, on November 13, 2001, announced his decision to reduce the number of operationally-deployed strategic warheads to 1,700-2,200 by the end of 2012. Such a reduction was codified in the Moscow Treaty and would be a two-thirds reduction from then-current levels. Subsequently, in May 2004, the President took steps to reduce the total size of the United States nuclear weapons stockpile. By 2012, the stockpile will be the smallest its been in decades nearly a factor of four reduction from the levels at the end of the Cold War.*

The alternatives described in this LLNL SW/SPEIS are consistent with national security policies, including reasonably foreseeable arms reductions. Regarding the future role of LLNL due to stockpile reductions, the three national weapons laboratories (Los Alamos National Laboratory [LANL], Sandia National Laboratory, and LLNL) possess most of the core intellectual and technical competencies of the United States in nuclear weapons. These competencies embrace more than 50 years of weapons knowledge and experience that cannot be found anywhere else in the United States. For the reasonably foreseeable future, a primary mission of LLNL will be to maintain the safety and reliability of the enduring stockpile, irrespective of the specific warhead types that remain in that stockpile.

02 PROGRAMMATIC PURPOSE AND NEED

- 02.01** Many commentors indicated that DOE should not conduct nuclear weapons research and development activities at LLNL. Many commentors indicated that the purpose and need statement is inconsistent, too-narrowly defines the range of alternatives, and does not provide evidence of any specific need or clear justification for the Proposed Action. Commentors were opposed to expanding nuclear weapons activities and developing new weapons systems, such as the “Robust Nuclear Earth Penetrator” and “mini-nukes.” Commentors are opposed to nuclear weapons production at LLNL. Commentors stated that the LLNL SW/SPEIS must include a discussion of impacts regarding future nuclear weapons development. Commentors expressed concern that the mission at LLNL represents an escalation from nonnuclear war to nuclear war. Commentor stated that disposition of weapons materials in the former Soviet Union should be addressed in the LLNL SW/SPEIS.

Response: *It is the United States policy for DOE to develop and produce the Nation’s nuclear weapons and to ensure the safety and reliability of the nuclear weapons stockpile. With the end of the Cold War, DOE has been developing strategies for appropriate adjustments to DOE missions and activities consistent with current national security policies that reflect post-Cold War policies, including a smaller enduring stockpile. However, even in the post-Cold War period, international dangers remain, and nuclear deterrence will continue to be a cornerstone of U.S. national security policy for the foreseeable future.*

The SSM PEIS describes the national security policy framework that defines the purpose and need for DOE’s nuclear weapons mission for the foreseeable future. The SSM PEIS also describes the development of proposed actions and reasonable alternatives in response to changes in national security policy, and puts those changes in a broad technical perspective. The ROD states that the SSP focus is moving away from large-scale development and production of new design nuclear weapons with nuclear testing, to one that focuses on the safety and reliability of a smaller, aging stockpile without nuclear testing. However, with this change in focus, national security policies require DOE to maintain the capabilities of the ongoing SSP. The actions selected in that ROD flow logically from the mission’s purpose and need, given the policy constraints placed on the program by the President and Congress. Enhanced experimental capability at LLNL such as the NIF and the Contained Firing Facility, are needed to provide a source of experimental data used to certify the performance of weapons components and also to verify the simulation models used to assess the safety and reliability of the weapons in the stockpile.

As indicated in Section 1.3 of the LLNL SW/SPEIS, the continued operation of LLNL is critical to the SSP and to preventing the spread and use of nuclear weapons worldwide. LLNL conducts a wide range of stockpile surveillance activities to assess the safety and reliability of weapons in the stockpile and to better understand the effects of aging on weapons. These surveillance activities include evaluating the pits in the primaries of

nuclear weapons. LLNL is the design laboratory for four weapons systems in the stockpile: the W87 and W62 intercontinental ballistic missile warheads, the B83 bomb, and the W84 cruise missile. LLNL supports production through research and development; however, LLNL is not a nuclear weapons production facility. The LLNL SW/SPEIS analyzes the environmental impacts associated with operations at LLNL for each of the alternatives, including operations associated with the nuclear weapons Stockpile Stewardship Program.

LLNL and other NNSA organizations are involved in the disposition of weapons materials from other nations, including Russia. This is included as part of the LLNL mission (see Section 2.3.4 of the LLNL SW/SPEIS).

- 02.02** Commentors stated that the purpose and need statement in the LLNL SW/SPEIS does not acknowledge LLNL's Biology and Biotechnology Research Program (BBRP), and whether LLNL is the best suited entity for going forward with the BSL-3 Facility. Commentors asserted that the BBRP and BSL-3 Facility are connected actions; therefore, the LLNL SW/SPEIS must include a review of the entire BBRP. Commentors indicated that the BSL-3 Facility should not be included as part of the No Action Alternative.

Response: *With respect to the existing LLNL BBRP, Chapter 2, Section 2.3.7 discusses this program as an existing program at LLNL as analyzed in the LLNL SW/SPEIS. Once operational, the BSL-3 Facility would be used by the BBRP. The BSL-3 Facility would not be a "connected action" to the BBRP. Rather, the BSL-3 Facility would be a new facility that expands and enhances the existing BBRP capabilities at LLNL. Per Council on Environmental Quality (CEQ) guidance (see 40 Code of Federal Regulations [CFR] §1508.25), actions are connected if they: (1) Automatically trigger other actions which may require environmental impact statements; (2) Cannot or will not proceed unless other actions are taken previously or simultaneously; or (3) Are interdependent parts of a larger action and depend on the larger action for their justification. Mere commonality of objectives is insufficient under CEQ to be a connected action. DOE continues to build upon existing research expertise located at its national laboratories to meet mission requirements. However, DOE has not expanded research such that its projects are concerted or systematic or connected in a National Environmental Policy Act (NEPA) sense. The BSL-3 Facility is included in the No Action Alternative because NNSA completed an environmental assessment analyzing the impacts for constructing and operating the BSL-3 Facility at LLNL and subsequently issued a Finding of No Significant Impact (FONSI) on December 16, 2002. See Comment Response 35.01 concerning the status and operation of the BSL-3 Facility.*

03 COST AND SCHEDULE

- 03.01** Many commentors expressed the opinion that spending money on nuclear weapons and LLNL would be a waste of taxpayers' money. Many commentors advocated spending this money on education, health care, environmental cleanup, renewable sources of energy, and other social programs.

Response: *Each year, Congress passes legislation defining the level of funding to meet Administration and Congressional policy direction. DOE/NNSA implements United States policy as established by the President and Congress.*

03.02 Commentors requested that the LLNL SW/SPEIS evaluate the total cost of all changes and modifications under the Proposed Action.

Response: *The LLNL SW/SPEIS provides analysis of the potential environmental impacts associated with the reasonable alternatives. Although cost is not a factor analyzed in the LLNL SW/SPEIS, the ROD will discuss costs, as appropriate.*

04 PROPOSED ACTION

04.01 Many commentors are opposed to various Proposed Action programs and projects at LLNL for a number of reasons to include:

- Violation of the Nuclear Nonproliferation Treaty
- Promotes a nuclear arms race
- Involves the use or increased use of radioactive and/or toxic materials (e.g., BSL-3) which are a health risk to the public
- Concerns about impacts to the local environment and endangered species
- Leads to development of new weapons designs or resumption of underground nuclear testing
- Redundant with other DOE laboratory activities

Commentors want DOE to scale down or completely eliminate nuclear weapons research and development. Commentors noted recent reports of lax security, heightening their concerns for the security of nuclear and biological materials. Other commentors supported the Proposed Action for LLNL's role in national security, science, and support of businesses in the surrounding communities. Commentors stated that LLNL does not have a meaningful mission.

Response: *The Proposed Action evaluates the environmental impacts of ongoing and new initiatives, activities, projects, and facilities' construction projected at LLNL for the foreseeable future (nominally 10 years) supporting weapons and non-weapons research and development. Those environmental impacts are compared with the No Action Alternative and the Reduced Operation Alternative to provide the decisionmaker with the range of reasonable alternatives needed for an informed choice. For specific responses to the comments stated above, see the following responses:*

Nonproliferation and nuclear arms race issues: 01.01, 01.03, and 02.01
Health risks: 23.01 and 23.02
Scaling down or elimination of weapons work: 06.01, 07.01, and 07.03
Weapons research and development: 02.01
Environment and endangered species concerns: 16.03
Security issues: 30.01 and 30.02

BSL-3 Facility issues: 35.01

Issues concerning the redundancy of laboratory activities: 08.01

General comments in support of, or opposed to, the Proposed Action have been noted and are included in the public record of this review.

The Proposed Action does not include the manufacture or production of nuclear weapons at LLNL.

- 04.02** Some commentors questioned the purpose and need for the High Explosives Development Center Project and replacement of the Energetic Materials Processing Center (EMPC). The LLNL SW/SPEIS does not provide justification of why existing facilities and equipment are obsolete. Commentors questioned what explosive material would be present at the EMPC at Site 300. The LLNL SW/SPEIS has not evaluated the synergistic and cumulative effects of these projects on existing activities at Site 300. Commentors questioned how EMPC waste disposal would be managed to prevent groundwater contamination. Commentors questioned what additional construction would be proposed under the No Action Alternative.

Response: *Section 3.3.8 has been amended to clarify that the EMPC is required to provide ongoing energetic materials processing capabilities which, when combined with increased computational capabilities, will add greatly to the understanding of weapons physics resulting in increased confidence in certification of the stockpile. Existing facilities that house activities planned for the EMPC are about 40 years old and are outdated. Typical explosives anticipated to be used in EMPC are the same as those currently in use at Site 300 and include HMX, PETN, RDX, TATB, and TNT.*

With respect to the purpose and need for the High Explosives Development Center (HEDC), Section 3.3.7 of the LLNL SW/SPEIS now includes the following information: “The HEDC will modernize and replace chemistry and materials science facilities built in the 1950’s and 1960’s at Site 300. These facilities must be rehabilitated or replaced to keep pace with the future work envisioned for mission-critical activities of the supporting facilities at Site 300 such as the Contained Firing Facility, the EMPC, and weapons life extension programs.”

With respect to the comment regarding preventing groundwater contamination from waste disposal, LLNL conducts waste management operations in accordance with applicable environmental laws and regulations. Adherence to these requirements minimizes the potential to contaminate the environment through implementation of strict administrative and engineered controls. Existing groundwater contamination, discussed in Section 4.17, is being addressed through the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) cleanup program under the oversight of the U.S. Environmental Protection Agency (EPA), Regional Water Quality Control Boards, and the California Department of Toxic Substances Control. See Appendix O and Section 5.6.10 for additional information concerning pollution prevention and groundwater mitigation measures.

Chapter 5 analyzes the cumulative “synergistic” impacts of the entire Proposed Action including the EMPC and HEDC at Site 300. Chapter 3, Section 3.2 describes all the projects, including construction activities, that are included in the No Action Alternative. Additional information on all alternatives can be found in Appendix A.

- 04.03** Commentors stated that the Petawatt Laser Prototype should be delayed until DOE provides more information on funded uses and the state of the previously used laser. Commentors requested that the LLNL SW/SPEIS address radiological impacts associated with the operations of the Petawatt Laser Prototype.

Response: *The petawatt laser system used on the Nova laser system was decommissioned in 1999. Key pieces of it are part of a petawatt laser system in the United Kingdom. Petawatt lasers are being assembled around the world because they are viewed as a basic science tool in the areas of astrophysics, laser fusion, and biomedical science. The petawatt laser proposed at LLNL would conduct experiments using energetic x-rays, electrons and protons. Though not presented separately, the radiological impacts associated with the Petawatt Laser Prototype operation are included in Section 5.3.14.2 as part of the analysis of the radiological health impacts associated with the Proposed Action.*

05 NO ACTION ALTERNATIVE

- 05.01** Some commentors questioned why the LLNL SW/SPEIS does not provide a “true” No Action Alternative. Commentors stated that this alternative does not serve as a baseline since it provides for future activities that have not been evaluated for impacts, and which would expand operations at LLNL. Some commentors expressed support for the No Action Alternative. Commentors identified elements of the No Action Alternative for which DOE has issued a Categorical Exclusion or Environmental Assessment (EA)/FONSI, and stated that these activities should be reviewed in the LLNL SW/SPEIS.

Response: *As discussed in Comment Responses 01.01 and 02.01, the SSM PEIS, which focuses on evaluating alternatives for maintaining the safety and reliability of the U.S. nuclear weapons stockpile without underground testing, remains valid today and provides a framework for the SSP and the LLNL site-specific proposals for the foreseeable future.*

As stated in Section 3.2, the No Action Alternative was analyzed to comply with CEQ’s NEPA implementing regulations (40 CFR Parts 1500-1508), providing a baseline against which the impacts of the Proposed Action and Reduced Operation Alternative can be evaluated. The No Action Alternative evaluates ongoing programs and operations, including approved interim actions, facility construction, facility expansion or modification, and facility decontamination & decommissioning (D&D) for which NEPA analysis and documentation already exists. The No Action Alternative accounts for the fact that LLNL has been an operational national laboratory for more than 50 years, with continuing missions expected for the foreseeable future. Such an approach is consistent with the CEQ guidance “where ongoing programs initiated under existing legislation

and regulations will continue, even as new plans are developed. In these cases ‘no action’ is ‘no change’ from current management direction or level of management intensity. Therefore, the ‘no action’ alternative may be thought of in terms of continuing with the present course of action until that action is changed (see CEQ Guidance, 40 Most Asked NEPA Questions).”

With respect to elements of the No Action Alternative for which DOE has issued a Categorical Exclusion or EA/FONSI, see Comment Response 31.09.

06 REDUCED OPERATION ALTERNATIVE

- 06.01** Some commentors supported selection of the Reduced Operation Alternative, others supported some elements, and still others believed that it should include more reductions in the area of nuclear weapons research and development. Some commentors objected to the inclusion of new and expanded activities in the Reduced Operation Alternative. Commentors would like the Reduced Operation Alternative to involve dismantling the nuclear weapons facility.

Response: *The Reduced Operation Alternative represents an approximate 30 percent reduction in SSP activities at LLNL. Specific activities are proposed for reductions to a level that provides only for mission readiness (i.e., can be ramped up to full operation if required). Requests for further reductions, to include elimination of all nuclear weapons related activities, are inconsistent with LLNL’s DOE assigned mission in the SSP and Purpose and Need for Agency Action (see Sections 1.3 and 3.5 of the LLNL SW/SPEIS for a more detailed discussion). No new activities beyond those with existing NEPA approval are included in this alternative. For a more detailed discussion concerning the underlying purpose and need for agency action, see also Comment Response 02.01.*

07 ALTERNATIVES CONSIDERED BUT ELIMINATED

- 07.01** Some commentors suggested LLNL be used for peaceful purposes as an alternative, such as an academic or environmental laboratory. LLNL’s expanded role in civilian science programs and potential conversion to a civilian research facility should be discussed in the LLNL SW/SPEIS. Some commentors requested that DOE incorporate alternatives for developing technologies for cleanup activities and renewable energy sources.

Response: *The range of reasonable alternatives developed within the LLNL SW/SPEIS responds to the programmatic purpose and need for critical support of NNSA’s SSP including preventing the spread and use of nuclear weapons worldwide. As explained in Section 3.5, alternatives that do not meet this purpose and need are not considered reasonable and, hence, are not analyzed in detail in the LLNL SW/SPEIS (40 CFR §1502.13). Additionally, the alternatives presented address LLNL’s ongoing missions in the areas of civilian sciences, including environmental cleanup, renewable energy programs, and waste management.*

- 07.02** Commentor stated that if the Proposed Action is approved, LLNL could resume full scale testing at the Nevada Test Site (NTS). The LLNL SW/SPEIS needs to address all aspects of LLNL's impact on the environment. Commentors stated that the land at the NTS rightfully belongs to the Western Shoshone Nation.

Response: *As stated in Chapter 1 of the LLNL SW/SPEIS, DOE/NNSA has prepared this document for continued operation of LLNL, responding to the purpose and need to support the nuclear weapons SSP. The purpose of the SSP is to maintain the safety and reliability of the U.S. nuclear weapons stockpile without underground testing at NTS. The missions at LLNL support that purpose. There is no connected action between the LLNL SW/SPEIS and underground nuclear testing at NTS. Operations at NTS are analyzed in separate NEPA documents.*

The Western Shoshone people maintain that the Ruby Valley Treaty of 1863 gives them rights to 37,000 square miles in Nevada, including the Yucca Mountain region. In 1977, the Indian Claims Commission granted a final award to the Western Shoshone people, who dispute the Commission's findings and have not accepted the monetary award for the lands in question. In 1985, the Supreme Court ruled that even though money has not been distributed, the United States has met its obligations with the Indian Claims Commission's final award and, as a consequence, the aboriginal title to the land has been extinguished. The past use of NTS lands by the Western Shoshone is acknowledged by DOE through its extensive consultation program with the Shoshone and other groups affiliated with the region. However, the land is currently owned and used by DOE.

- 07.03** Commentor suggested that the LLNL SW/SPEIS use a conventional "baseline" that would involve ordinary land uses rather than hazardous activities already ongoing. The LLNL SW/SPEIS should further address the eventual "decommissioning" or brownfield status of the LLNL after most, if not all, operations have ended.

Response: *As stated in Section 3.2, the No Action Alternative was analyzed to comply with CEQ's NEPA implementing regulations (40 CFR Parts 1500-1508), providing a baseline against which the impacts of the Proposed Action and Reduced Operation Alternative can be evaluated against. The No Action Alternative evaluates ongoing programs and operations, including approved interim actions, facility construction, facility expansion or modification, and facility D&D for which NEPA analysis and documentation already exists. The No Action Alternative accounts for the fact that LLNL has been an operational national laboratory for more than 50 years, with continuing missions expected for the foreseeable future. As explained in Section 3.5 of the LLNL SW/SPEIS, the decommissioning and eventual "brownfield" status of the LLNL was considered but eliminated from detailed analysis. Any future proposals related to D&D would be subject to appropriate NEPA review.*

08 OTHER ALTERNATIVES

- 08.01** Several commentors stated that the alternatives presented in the LLNL SW/SPEIS do not reflect a range of reasonable of alternatives for LLNL's future role in supporting the

missions of DOE. The LLNL SW/SPEIS should evaluate restructuring of weapons design capabilities among the three DOE laboratories as recommended by the “Galvin Commission.” Several commentors suggested the purpose and need, and alternatives be revised to eliminate redundancy and promote consolidation of nuclear weapon activities to other sites such as Pantex and NTS, such that the environmental impacts at LLNL can be reduced. Commentors expressed concern for the redundancy in constructing supercomputing centers at all three DOE laboratories. Commentors stated that programs and activities at other DOE sites related to the Proposed Action or the No Action Alternative should be evaluated as “connected actions.” There should also be an option to move all radioactive and weapons materials to a more secure and seismically safe facility that is located away from population centers and sensitive species habitats. Commentors questioned if LLNL plutonium operations and stockpile maintenance activities could be transferred to another site within the DOE complex. Some commentors recommended that LLNL consider the “curatorship option” under which DOE would rely on surveillance and nonnuclear testing to determine when repairs are necessary to nuclear weapons.

Response: *The LLNL SW/SPEIS includes a range of reasonable alternatives that respond to the programmatic purpose and need in support of DOE/NNSA’s stockpile stewardship missions. Any alternative that does not respond to this purpose and need is considered not reasonable. DOE believes that the programmatic purpose and need in the LLNL SW/SPEIS is appropriate as it responds to the national security policy established by the Administration and Congress.*

As stated in Section 1.3.2 of this LLNL SW/SPEIS, LLNL conducts a wide range of stockpile surveillance activities to assess the condition of LLNL-designed weapons in the stockpile and to better understand the effects of aging on weapons. In some cases surveillance activities on systems designed by other weapons laboratories may be assigned to LLNL. As a result, LLNL must have similar analytical tools to support their mission. The issue of potentially consolidating the nuclear weapons activities of the national laboratories was previously addressed in the SSM PEIS (see Sections 2.4.1 and 3.1.2 of that document). The SSM PEIS conclusion, “that further significant reductions or consolidations of the weapons laboratories would counter efforts to maintain core competencies and to develop new technologies necessary to ensure continued high confidence in the safe and reliable stockpile,” remains valid today. As such, DOE does not consider consolidation of the national laboratories, such as recommended by the Galvin Committee, to be a reasonable alternative. The issue of “curatorship” was also previously addressed in the SSM PEIS (see Volume IV, Comment Response 40.36). The SSM PEIS stated that “curatorship” alone was not a reasonable alternative for maintaining the safety and reliability of the stockpile in the absence of underground nuclear testing, remains valid today. As such, “curatorship” is not considered a reasonable alternative in this LLNL SW/SPEIS.

DOE/NNSA prepares programmatic NEPA documents that evaluate environmental impacts of alternatives affecting multiple sites. DOE/NNSA prepares site-wide EISs to assess the environmental impacts of reasonable alternatives for operations at a

particular site. This LLNL SW/SPEIS assesses site-specific environmental impacts for the stockpile stewardship mission activities at LLNL and is a Supplemental EIS for the SSM PEIS for the use of proposed material on the NIF. This LLNL SW/SPEIS includes, as appropriate, an analysis of all connected actions, cumulative actions, and similar actions. Operations at other DOE/NNSA sites are covered, as appropriate, by site-wide NEPA documents for those sites.

- 08.02** Several commentors suggested that due to deficiencies in the security of nuclear materials at LLNL and other DOE sites, the LLNL SW/SPEIS should evaluate an alternative that would remove all weapons and radioactive materials from LLNL. Many commentors cited congressional reports and testimony, as well as a speech from the Secretary of Energy, concerning nuclear material security deficiencies at LLNL and other DOE sites.

Response: *Removal and relocation of nuclear materials to another DOE/NNSA laboratory is not considered a reasonable alternative as it would not respond to the programmatic purpose and need for stockpile stewardship missions at LLNL. Section 3.5 of the LLNL SW/SPEIS explains why this alternative is unreasonable and was eliminated from detailed analysis. The storage and use of this material at LLNL is considered safe and secure. Security concerns are addressed in classified security documents, and facilities provide the required safeguards necessary to securely protect all materials.*

The alternative of “moving all radioactive and weapons material to a more secure and seismically-safe facility” is discussed in Section 3.5 of the LLNL SW/SPEIS which explains why this alternative is unreasonable and was eliminated from detailed analysis. While DOE/NNSA notes the concerns expressed in congressional reports and testimony, and the Secretary of Energy’s speech, DOE/NNSA maintains that the storage and use of radioactive and weapons material at LLNL is safe and secure. The reduction and consolidation of nuclear material is a complex-wide issue and if a proposal is developed, a separate NEPA analysis would be conducted, as appropriate.

- 08.03** Commentor suggested an alternative to the Proposed Action be considered that would allow LLNL to meet its basic mission objectives while reducing, or at least, not increasing, potential environmental impacts over the No Action Alternative.

Response: *The alternatives analyzed in this LLNL SW/SPEIS are considered reasonable and appropriately respond to the programmatic purpose and need. As described in Section 3.4, the LLNL SW/SPEIS includes the Reduced Operation Alternative, which would maintain full operational readiness for NNSA facilities and operations, but does not represent the level of operations required to fulfill the Stockpile Stewardship Program mission assigned to LLNL for the foreseeable future. Section 5.6 discusses mitigation measures which have the potential to reduce environmental impacts.*

09 LAND USE

- 09.01** Commentors expressed the following comments concerning Figure 4.2.1.1–1, Livermore Site Surrounding Land Uses:

- The area north of I-580, east of Vasco Road and west of Laughlin Road is primarily zoned Residential, not Rural Residential.
- The area east of Vasco Road and south of East Avenue is Subarea 1 of the City's South Livermore Valley Specific Plan. Single-family residential development by Meritage Homes and Pacific Union Homes (133 units total) is currently underway in this area.
- Subarea 2 of the South Livermore Valley Specific Plan is located south of East Avenue and west of Vasco Road. A significant portion of this area is under development with single-family residences by Signature Homes (550 units total) and Greenbriar Homes.

Response: *All designations are from the municipal or county general plan and zoning maps. Comments noted and Figure 4.2.1.1–1 has been changed. These changes have been identified by sidebars.*

09.02 Commentors expressed the following comments concerning Figure 4.2.2.1–1, Livermore Site Surrounding Land Use Designations:

- Livermore recently completed a comprehensive update of the General Plan with the adoption of the 2003 General Plan in February 2004. Land use designations for several properties in the vicinity of LLNL have changed as a result of the updated General Plan.
- The land use designation for 38 acres located east of Vasco Road and north and south of Brisa Street was changed from High Intensity Industrial to Urban High-3 Residential (14–18 units per acre). This site is located adjacent to the Vasco ACE station.
- The Service Commercial area located north of I-580 and east of Herman Avenue is property owned by BART and is planned for future transit oriented development. The area has been redesignated as Urban High-2 Residential (8–14 units per acre), Urban High-3 Residential (14–18 units per acre), and BART.
- The area east of Greenville just south of I-580 is not designated as Large Parcel Agriculture.
- LLNL and Sandia National Laboratory/California (SNL/CA) are now designated as Community Facilities-Research and Development.

Response: *The data provided was evaluated and changes were made in Figure 4.2.1.1–1 and Figure 4.2.2.1–1, as appropriate. These changes have been identified by sidebars. The data presented are more than adequate to determine impacts according to NEPA.*

09.03 Commentor expressed the following comments concerning city of Livermore planning programs:

- The discussion related to the City's General Plan on p. 4.2-9 and 4.2-10 need to be updated to reflect current policies and programs.
- The North Livermore Area "A" General Plan Amendment adopted by the City in March 1988 (p. 4.2-10) has been incorporated into the updated General Plan and is no longer a separate planning document.

- The update for the Livermore Municipal Airport Master Plan is currently underway. The City Council recently formed an advisory committee to review the proposed draft Master Plan and provide recommendations to the city and county. Completion of the update process, including public review of the draft Master Plan and environmental documents, is tentatively scheduled for the end of 2004.

Commentor stated that the LLNL SW/SPEIS should analyze the appropriateness of continued weapons research, development, and manufacturing activities in close proximity to growing suburban communities, for example the development of the Tracy Hills project within 1 mile of Site 300.

Response: *The data presented is adequate to determine the impacts to land use according to NEPA. With regard to the comment on encroachment, the LLNL SW/SPEIS assesses potential direct, indirect, and cumulative impacts to the population surrounding the Livermore Site due to Livermore Site activities.*

10 COMMUNITY SERVICES

- 10.01** Commentor stated that civilian first response teams need to know the exposure risks in advance, in the event of an accident. There is no discussion of the impact on Alameda or San Joaquin County health and environmental departments in the follow up to a significant release or that they were consulted in the preparation of Appendix D.

Response: *As stated in Appendix I, Section I.2.4.1, the Alameda County Sheriff's Office of Emergency Services is the lead offsite response coordination agency for major emergency and disaster situations at or affecting the Livermore Site. If the emergency situation requires that the general public be warned, the emergency public information is issued by the cognizant local agency, such as the cities of Livermore or Tracy or counties of Alameda or San Joaquin, depending upon the area affected by the incident.*

As stated in Appendix I, Section I.3.1.7, formal and informal relationships exist between LLNL and external emergency planning and response agencies and organizations. Where possible, interrelationships with Federal, state, and local organizations are prearranged and documented in formal plans, agreements, and understandings for mutual assistance detailing the emergency support to be provided. A list of these agencies and organizations is included in this section. See Comment Response 15.01 for a discussion of offsite impacts associated with accidents.

11 PREHISTORIC AND HISTORIC CULTURAL RESOURCES

- 11.01** Commentor requested that DOE complete a National Register of Historic Places evaluation at Site 300, particularly of subsurface prehistoric cultural resources. Commentor questioned if there is a conflict of interest by using LLNL archeologists as opposed to hiring an independent contractor.

Response: *The Programmatic Agreement in Appendix G was developed with the State Historic Preservation Officer (SHPO) and requires completion of an inventory and National Register of Historic Places evaluation for both historic and prehistoric resources no later than February 2005. The Programmatic Agreement also specifies an agreed-upon process until the inventory and assessment is complete.*

Prior to conducting activities with the potential to affect cultural resources, DOE identifies resources located within the region of influence, evaluates them for eligibility to the National Register of Historic Places, and determines the potential for the activity to affect important resources. DOE then consults with the SHPO regarding the determination of effect, per Section 106 of the National Historic Preservation Act (NHPA). Subsurface prehistoric cultural resources would only be identified through discovery during construction excavation. Should this occur, the excavation activity would be halted in the vicinity of the discovery, DOE would have the resource recorded and evaluated by a professional archaeologist, and the information would be provided to the SHPO in consultation under Section 106. As part of their review, the SHPO would evaluate the work conducted by the archaeologist to determine if it was done properly. In general archeologists are LLNL employees; however, outside archeologists are brought in for a specific project. Reports prepared by LLNL are submitted to DOE for review and approval and transmitted to the SHPO for consultation.

- 11.02** Commentor stated that the potential impacts on historic resources from D&D activities are inconsistent. The first and second paragraphs in Section 5.3.4.2 and Table 3.6–1 contradict each other.

Response: *Tables 3.6–1 and S.6–1 have been revised to correct the inconsistency.*

- 11.03** Commentor stated that the LLNL SW/SPEIS could be in violation of the *National Historic Preservation Act* that requires agencies to obtain prior approval of the expenditure of Federal funds before construction. The Programmatic Agreement in Appendix G states that the NNSA and the University of California will complete their inventory and assessment no later than February 2005. If Federal funds are allocated before these assessments are complete, then DOE will be in violation of 16 *United States Code* (U.S.C.) 470f.

Response: *The Programmatic Agreement revises procedures outlined in 36 CFR Part 800. By execution of the Programmatic Agreement and fulfillment of its terms, NNSA has satisfied its responsibilities under Section 106 of the NHPA and its implementing regulations. No funds would be expended on projects or activities for which Section 106 has not been completed. Funds would be allocated to projects where Section 106 compliance has already been completed.*

12 AESTHETICS AND SCENIC RESOURCES

- 12.01** Commentors stated that policies of the Scenic Route Element of the 1976 General Plan have been incorporated in their entirety into the Community Character Element of the

2003 General Plan. Other visual resource policies of the 1976 General Plan, including amenities designated for preservation as indicated in Table 4.6.1–2, have also been carried forward in the 2003 General Plan.

Response: *Thank you for the information. The data presented in the Draft LLNL SW/SPEIS is adequate to determine the impacts according to NEPA and the draft City of Livermore General Plan 2003-2005 is included in the references (City of Livermore 2003).*

13 METEOROLOGY

No comments were received related to meteorology.

14 GEOLOGY

- 14.01** Several commentors expressed concern regarding fault lines and potential earthquake risk in the vicinity of LLNL. The alluvial or Franciscan soils underlying LLNL are unstable. In particular, the Greenville and Calaveras faults should be analyzed in detail, as they have caused dangerous earthquakes in the past. The Las Positas fault is less than a mile away from the lab and, as stated in the LLNL SW/SPEIS, its hazards are poorly understood. The San Andreas fault also poses a risk. Information concerning the fault zone less than 200 feet from LLNL property should be included in the Summary. Earthquake scenarios must include the potential for substantial ground cracks as well as shaking. Commentor opposed nuclear materials buildup in a seismically active area, and requested an explanation of all planned activities near fault zones, an analysis of potential harms/damages from an earthquake at the highest reasonably expected level, and any precautions that have been or will be taken to mitigate harm.

Commentors also requested that the LLNL SW/SPEIS include a complete list of buildings and account for the buildings that house hazardous, biological, and radioactive materials. Commentors stated that some buildings at LLNL do not comply with Federal seismic standards, have unacceptable seismic risks, and need to be brought up to code. The LLNL SW/SPEIS needs to provide a list of the buildings' names and locations so that they may be retrofitted to accommodate Proposed Action activities. Commentors suggested that the lab have no increase in plutonium or tritium amounts or storage until all seismic upgrades are completed.

Response: *The analysis of geologic hazard presented in the LLNL SW/SPEIS includes the discussion of the Greenville, Calaveras, and Las Positas Faults. The latest analyses for those faults are discussed in the LLNL SW/SPEIS. These analyses not only included LLNL specific studies (LLNL 2002dk), but also analyses for the city of Livermore (City of Livermore and LSA 2002) and those for the entire central California region (USGS 2003). The most recent LLNL analysis addresses the contribution of local faults, including the Greenville and Las Positas faults, and regional faults, including the San Andreas and Calaveras faults. The information in the LLNL SW/SPEIS regarding levels of risk uses the most recent information from these recent analyses. These analyses estimate the probabilities that the faults in the area will produce earthquakes with strong*

to violent ground motion. The U.S. Geological Survey analyses, while more regional in perspective, also analyze the seismic risk for the San Andreas, Calaveras, and Greenville faults. These analyses represent the best knowledge currently available for the seismic risk associated with these faults. While older references are cited, those citations are primarily used for specific language.

The discussion of seismic risk at LLNL in Appendix H of the LLNL SW/SPEIS includes the consideration of the Las Positas Fault as a substantial contributor to the seismic hazard at LLNL because it passes within 1 mile of the Livermore Site. The use of the term “poorly understood” in Appendix H in describing the Las Positas fault occurs where the context is a description of how the fault geometries are used in calculating the risk. Since the fault geometry of the Las Positas Fault is uncertain, each of the potential fault geometries is used in the hazard calculations. This method conservatively estimates the hazard posed by the fault even though the exact fault geometry is not fully understood.

The LLNL SW/SPEIS Summary briefly presents information concerning those impacts that significantly differentiate among the alternatives evaluated in the LLNL SW/SPEIS. The seismic risk associated with the Las Positas Fault is discussed in Chapter 4, Section 4.8 of the LLNL SW/SPEIS as part of the total seismic risk from all local and regional faults. However, the seismic risk does not significantly differ among the alternatives being considered in this LLNL SW/SPEIS. Therefore, the seismic risk was not discussed in the Summary; however, Appendix D includes analysis of a site-wide earthquake, and the seismicity of the region surrounding LLNL is discussed in Appendix H.

Ground cracks resulting from earthquakes are mainly due to two mechanisms. The first is the displacement of ground due to movement along the surface trace of a fault. The second is where the earthquake causes liquefaction in susceptible sediments underlying more solid or competent sediments. The liquefied sediment starts to slosh into waves as shaking from the earthquake continues. The overlying layer of sediment gets broken and cracks in the overlying layers can open and close.

The hazard of surface faulting is not regional in extent as is ground shaking, but instead is restricted to the displaced segment of a relatively narrow linear fault zone. The LLNL SW/SPEIS discusses the potential for surface faulting at the Livermore Site and Site 300 in Section 4.8.3, Geologic Hazards. The potential for surface faulting within the Livermore Site is very low since there are no traces of surface faults on the Livermore Site. Traces of surface faults do occur at Site 300. The only structures located adjacent to the surface faults are Buildings 899A and 899B at the pistol range. No new facilities are proposed near the faults.

The LLNL SW/SPEIS also discusses the potential for damage from liquefaction at both the Livermore Site and Site 300. Based on the fairly deep groundwater levels, the uniformly distributed, poorly sorted sediments beneath the site, and a relatively high degree of sediment compaction, the potential for damage from liquefaction at the Livermore Site is quite low. Based on the presence of bedrock beneath Site 300 and the

age, composition, and unsaturated condition of the terrace deposits, the potential for liquefaction at Site 300 is low.

Appendix A provides a list of buildings that store and use hazardous and radioactive materials. Summary, Section S.5.2.18; Chapter 3, Section 3.3.18; and Appendix A, Section A.2.4.16 include information pertaining to seismic upgrades and their prioritization. Appendix D, Section D.6 includes an impact analysis of an earthquake on LLNL facilities.

- 14.02** Commentor stated that the *Antiquities Act* of 1906 is not mentioned in reference to construction at Site 300. The LLNL SW/SPEIS should analyze vertebrate fossils, shells, leaves, and stem deposits or state the basis for omitting this reference. The discussion of construction for the NIF at the Livermore Site included the statement that “Should any buried materials be encountered, LLNL would evaluate the materials and proceed with recovery in accordance with the requirements of the *Antiquities Act*.”

Response: *Per Appendix M, Section M.5.3.4, the discussion of construction for the NIF at the Livermore Site included the statement that, “Should any buried materials be encountered, LLNL would evaluate the materials and proceed with recovery in accordance with cultural requirements and agreements.”*

All construction at LLNL, including the Livermore Site and Site 300, is subject to the requirements of the Antiquities Act. The Antiquities Act regulates the protection of objects of historic and scientific interest on lands owned or controlled by the United States Government. The Secretary of the Interior has jurisdiction over the lands at the Livermore Site and Site 300 for these purposes. The LLNL Environmental Safety & Health (ES&H) Manual states that if non-human bones or fossils are found, a permit to excavate may be required through the U.S. Department of the Interior (DOI). The Environmental Evaluation Group within the Operations & Regulatory Affairs Division (ORAD) will coordinate activities that may need to be implemented should paleontological resources be identified. Plant Engineering at LLNL has a soil excavation, grading, and/or drilling permit process in place for all such Site 300 projects that may involve surface disturbance.

If bones are found and determined not to be of recent human origin (i.e., paleontological resources), ORAD will notify the University of California Paleontology Museum staff, who will then identify and assess the importance of the discovery. In consultation with the DOI, DOE will then determine whether to either seek a permit from the DOI to excavate the find or preserve the resource in place. Under no circumstances may anyone remove or disturb any artifacts or remains.

The LLNL SW/SPEIS, Chapter 5, Section 5.3.6.2, has been revised to read, “Should any buried materials be encountered during construction anywhere at the Livermore Site or Site 300, LLNL would evaluate the materials and proceed with recovery in accordance with the requirements of the Antiquities Act.”

- 14.03** Commentor stated that DOE's reliance on secondary sources to evaluate seismic hazards at Site 300 is below standards set by the 2002 Interagency Committee on Seismic Safety in Construction (ISCCS) report. The Livermore Site Seismic Safety Program should perform an assessment of geological hazards at Site 300, similar to the one performed at the Livermore Site. Seismic upgrades scheduled for Site 300 buildings should be based on primary reconnaissance studies of the buildings and surrounding area. DOE should assess risks of landslides from seismic events at Site 300. Some commentors stated that the life safety standard was used for earthquake analysis, which is the lowest seismic Federal standard, and recommended the use of operational standard to evaluate hazards. In addition, the LLNL SW/SPEIS should disclose whether buildings must be operational during and after an earthquake and whether DOE applied any agency specific criteria pursuant to the ISCCS report.

Response: *The assessment of the seismic safety of facilities at LLNL incorporates, as factors, the activities that take place within the facility, the worker population, and the types and amounts of hazardous materials within the facility. It is DOE's policy to design, construct, and operate its facilities so that workers, the general public, and the environment are protected from the impacts of natural phenomena hazards. Safety requirements include: providing a safe work place, maintaining operation of essential facilities, and protecting against exposure to hazardous materials during and after occurrences of natural phenomena events.*

Within each facility, parts of the facility and equipment are designed to withstand different levels of ground motion. Safety class systems (e.g., those systems necessary for safe shutdown of the facility or maintaining confinement of hazardous materials) are designed the most rigorously. Safety class systems include emergency generators and their fuel tanks, tanks for firewater, sprinkler systems, heating, ventilation, and air conditioning (HVAC) for areas with negative pressure, etc. If a facility becomes non-operational after an earthquake, these safety class systems are designed to remain functional. Other systems are designed to withstand lesser amounts of ground motion.

Each building at LLNL was constructed in accordance with the standards that were applicable when it was built. Standards are continuously undergoing change, and while buildings are not rebuilt each time the standards change, seismic retrofits are considered each time buildings undergo a major renovation and when plans are made to significantly change a building's function. The standards usually include safety goals such as minimizing risk to building occupants and maintaining containment of hazardous materials. DOE has designated that LLNL should use the International Council of Building Officials 2000 standard as minimums even though the State of California has not adopted them. Other requirements are more restrictive depending on exact building design and uses.

All facilities at LLNL have been evaluated against modern criteria, current and planned use, and building population and inventory. These evaluations allowed for ranking of the facilities by the amount of retrofit that could be required. This evaluation is used as part

of the overall planning for LLNL to determine if buildings should be replaced, their use changed, or if they should be upgraded or retrofitted and to what degree.

The extent of upgrade is determined by planned use, the ability of the building to be retrofitted to current standards, and the cost versus benefit of the upgrades. Not every building can be retrofitted the same way. For example, it is sufficient for some buildings to undergo simple engineering reinforcement. Other facilities require the addition of shear walls and the sealing of some wall penetrations.

Updated information was added in Appendix H, Section H.2 on the seismic upgrades of Buildings 141, 151, 298, 321, and 511. Building 151 was fully retrofitted. Shearwalls were added, windows were blocked off, and extra footings were poured for the shearwalls. Buildings 141, 298, 511, and 321 were retrofitted with reinforcements to the roof connections and other building elements. The lateral resistance of the walls was strengthened if the walls were easily accessible and could be reinforced. Frames were added to some walls. These measures help the building act as a whole unit during the earthquake so that damage is minimized. Some damage will occur in these facilities, (e.g., cracks in the walls, drywall flaking off), but they will not collapse and life safety will be maintained.

15 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

- 15.01** Some commentors stated that LLNL is the largest employer in the city of Livermore which in turn helps support the local economy. LLNL also supports small businesses and maintains educational and industrial partnerships.

Commentors suggested that the Bay Area economy could be affected by a nuclear accident at LLNL.

Response: *The comments supporting LLNL due to its positive economic benefits are noted. The impacts and risks concerning accidents are discussed and compared in Chapter 3, Section 3.6.11; Chapter 5, Section 5.5; and Appendix D. The accidents analyzed included nuclear, chemical, explosives and biological. The results of the analyses show minimal offsite impacts. Therefore, the effect on the economy would be minimal.*

- 15.02** Some commentors stated that the socioeconomic and environmental justice analysis is incomplete and underestimates the problems associated with the Proposed Action. Population densities, potential future growth patterns, and demographic analysis of surrounding communities should be evaluated in greater detail. The LLNL SW/SPEIS should discuss how property values, population densities, safety perceptions, and health and safety risks impact low-income and minority communities in the vicinity of both sites. A commentor requested that the LLNL SW/SPEIS adequately analyze the economic and social impact of potential releases and accidents at LLNL. The commentor questioned why a low-income and minority community surrounding the lab, which has existing elevated cancer risks, now has additional types of projects that will contribute to

existing contamination. In addition, a commentor stated that waste shipments to Hanford should be evaluated for environmental justice impacts, given the right of Native Americans to live and fish along the Columbia River.

Response: *Executive Order 12898 directs the Federal government to identify and address “disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” Within this Executive Order, it is not enough to establish that minority or low-income populations exist within the region of influence, but that the effects from the action would be disproportionately high and adverse to these populations. The environmental justice analysis in the LLNL SW/SPEIS uses census block groups to identify areas of minority or low-income populations. In general, a block group contains between 600 and 3,000 people and is the smallest tabulation entity readily available from the U.S. Census Bureau. Note that the CEQ guidance, Environmental Justice Guidance Under the National Environmental Policy Act (CEQ 1997) specifies “that Agencies may use demographic data available from the Bureau of the Census to identify the composition of the potentially affected population.” Because individuals who could be classified as minority or low income would be expected within most groups of 600 to 3,000 people, the LLNL SW/SPEIS compares the percentages of minority and low-income individuals within each block group with statewide averages to determine if the block group could be considered a minority or low-income population. Despite the presence of minority and low-income individuals, the populations nearest to the Livermore Site or Site 300 cannot be classified as minority or low-income based on criteria used in the analysis.*

The impacts and risks concerning accidents are discussed and compared in Chapter 3, Section 3.6.11; Chapter 5, Section 5.5; and Appendix D. The accidents analyzed included nuclear, chemical, explosives, and biological. Details concerning health impacts are discussed in Comment Response 23.02. The results of the analyses show minimal offsite impacts. Therefore, no disproportionately high and adverse human health or environmental effects on minority and low-income populations are expected.

Radioactive material shipments, to or from Hanford, were analyzed as part of the ITP under the Proposed Action. ITP has been removed from the Proposed Action and the shipments from Livermore to Hanford are no longer reasonably foreseeable.

16 BIOLOGICAL RESOURCES

16.01 Commentor expressed concern regarding tritium levels in Livermore wine and impact to area wineries should levels increase.

Response: *The tritium concentrations in Livermore wines are on average less than 0.2 percent of the EPA’s drinking water standard of 20,000 picocuries per liter (LLNL 2003l). The Proposed Action does not include tritium emissions above historical levels as described in Sections 5.2.7.2 and 5.3.7.2. Therefore, the Proposed Action is not expected to have a negative impact on area wineries.*

16.02 Commentor contended that specific plans in Appendix E would pose serious harm to the California red-legged frog, the California tiger salamander, and/or the Alameda whipsnake, for the reasons outlined below:

- Impact to species from maintenance of Arroyo Las Positas, security buffer, drainage systems, facilities, roads, utilities, storm drainage system, culverts, and landscape
- Increase in vehicle traffic
- Wildlife management (e.g., invasive species, ground squirrel control, herbicides)
- Impacts from construction (e.g., EMPC) and D&D. The LLNL SW/SPEIS does not discuss impacts on different species from radiological and chemical releases.
- Wetland removal and termination of surface water releases. Appendix F should identify all areas of wetland habitat that would be enhanced and managed for the California red-legged frog.
- Grading and maintaining fire trails
- Prescribed annual burning
- Explosive process water surface impoundments and sewage oxidation pond activities

Commentor contended that it is reasonably foreseeable that the California tiger salamander could be spotted on the Livermore Site within the period covered by this LLNL SW/SPEIS, and must therefore be discussed in the biological assessment.

The LLNL SW/SPEIS frequently cites mitigation measures that were approved by U.S. Fish and Wildlife Service (USFWS). Many of these measures were approved and coordinated by USFWS for LLNL in 1998, 3 years prior to the listing of critical habitat in March of 2001 (page E-64, E-68 of the Draft LLNL SW/SPEIS). If critical habitat is reinstated, these measures might not be adequate under the stricter requirements for critical habitat. The LLNL SW/SPEIS needs to discuss updated measures so that the regulators, legislators, and community members can comment on the adequacy of the plans. Mitigation measures for the Alameda whipsnake are especially ineffective because they rely on identification, trapping, removal, and relocation, a highly unlikely scenario when workers are confronted with a snake (page E-94 in Draft LLNL SW/SPEIS). Please describe how LLNL plans to ensure worker compliance with the mitigation measures.

The proposed breeding habitat at the Super High Altitude Research Project (SHARP) Facility is inadequate because that site contains unknown levels of tritium (page E-99 of the LLNL SW/SPEIS). The site also does not have the proper characteristics for a California red-legged frog breeding ground (page E-100 in Draft LLNL SW/SPEIS).

Many of the proposed mitigations require onsite observation by qualified wildlife biologists. However, few places mention whether this biologist would be a lab employee or an independent contractor. It is exceedingly important that wildlife training and mitigation be done by unbiased and disinterested parties.

DOE should address the issue of encroachment.

Proposed wetland mitigation measures are also inadequate. With regards to wetlands at Site 300, the Proposed Action terminates surface releases at Buildings 865 and 851. The LLNL SW/SPEIS states that this was coordinated with the USFWS and received approval contingent upon implementation of mitigation measures in a recent Biological Assessment and related Biological Opinion (Jones and Stokes 2001, USFWS 2002b). Please provide the document submitted to the USFWS.

Response: *All proposed projects that occur in or near sites with the potential to impact Federal or state listed or special status species or sensitive habitats are conducted under consultation and opinion with the USFWS; and as needed, appropriate mitigation measures and operating procedures are developed and followed to minimize impacts to the species or habitats. Additionally, LLNL wildlife biologists provide pre-construction surveys on outdoor land disturbance projects to verify the presence or absence of listed or special status species and habitats; and monitor these activities when key species and habitats are present in or near the project site.*

All utilities, maintenance, and infrastructure projects (such as the Arroyo Las Positas Maintenance Project) follow these requirements. As noted in Appendix E, maintenance of facilities, paved roads, security buffers, and utilities at LLNL pose minimal risk to the listed and special status species and habitats, since these activities are primarily in upland areas where these species do not typically occur. The impact of these activities is minimal and not different among the alternatives. See Chapter 5, Sections 5.2.7, 5.3.7, and 5.4.7.

As noted in Appendix E, vehicle traffic occurs on paved roads and bike trails pose minimal risk to the California red-legged frog at LLNL, since this traffic occurs primarily during daylight hours, and also outside of areas where this species is typically present. Invasive species, such as the bullfrog at the Livermore Site's Drainage Retention Basin, is a predator on the California red-legged frog. A Bullfrog Management Program was established to reduce this predator species onsite. This program is coordinated with USFWS to ensure compliance with the Endangered Species Act, as noted in Appendix E.

Herbicide applications pose minimal risk to the listed and special status species and habitats because herbicides are applied outside of areas where these species typically occur, and certified pesticide applicators apply these chemicals in accordance with EPA's pesticide labels. As noted in Appendix E, ground squirrel control at Site 300 is performed infrequently and in accordance with EPA rodenticide label instructions.

The LLNL SW/SPEIS does not identify the impacts on different species of chemical or radiological releases. Programs are in place to prevent and mitigate chemical and radiological releases.

The wetlands being removed near Buildings 801, 827, and 865 at Site 300 have been coordinated with the USFWS as noted in Appendix E, Section E.2.2, and other wetlands at Site 300 would be enhanced as mitigation for loss of habitat for the California red-legged frog.

Grading and maintaining fire trails is a necessary activity for the continued operation of Site 300. This activity has the potential to harm the Alameda whipsnakes, as noted in Appendix E. However, such activities have been coordinated with the USFWS, and application of their guidance has, to date, avoided any incidental take.

Prescribed burns at Site 300 could result in harm to listed and special status species. The procedures for these burns, described in Appendix E, represent continuation of guidelines in a biological opinion previously issued by the USFWS, which authorized incidental take for the California red-legged frog and the Alameda whipsnake.

As noted in Appendix E, Section E.2.2, these explosive process water surface impoundments and sewage oxidation ponds provide suboptimal habitat and therefore, activities in these areas are unlikely to adversely affect California red-legged frog and tiger salamander populations at Site 300. In the future, NNSA is considering closing the impoundments and diverting the wastewater to an aboveground storage tank after consultation with USFWS.

The California tiger salamander has not been found at the Livermore Site. If found, NNSA would consult with the USFWS.

The LLNL SW/SPEIS cited mitigation measures from biological opinions issued by the USFWS, when they pertained to continuing operations at Site 300 without changes requiring additional mitigative actions. DOE believes these mitigations are adequate for all alternatives evaluated. However, after reviewing the LLNL SW/SPEIS and the related biological assessment, the USFWS may recommend additional guidance through a biological opinion if additional mitigations are considered appropriate to comply with new regulations and listings (e.g., changes in designation of critical habitat). A critical habitat for the tiger salamander has been proposed and does not include either the Livermore Site or Site 300. Though recently rescinded, a critical habitat has been proposed for the California red-legged frog which does include the Livermore Site and Site 300. However, throughout this process, LLNL has continued to implement the mitigation measures and will re-evaluate them based on the final determination of critical habitat following the regulatory procedures for compliance with the Endangered Species Act.

DOE is using mitigation measures for the Alameda whipsnake that were issued in a previous biological opinion by the USFWS. Those measures apply to continuing operations with little, or no, change since those mitigation measures were developed. LLNL provides awareness training to workers for identification and mitigation measures for the Alameda whipsnake.

The proposed California red-legged frog breeding habitat at the SHARP Facility was submitted to the USFWS.

DOE agrees that individuals involved in mitigation be adequately trained and perform work in a professional, unbiased manner. In general, biologists are LLNL employees,

however, outside biologists may be brought in for specific projects. In addition NNSA has staff that provide oversight of LLNL activities. LLNL biologists submit biological assessments to DOE. After review, DOE submits biological assessments to USFWS for consultation and subsequent issuance of biological opinions.

With regard to encroachment, see Comment Response 09.03.

Wetland mitigation measures associated with the termination of surface water releases at Buildings 865 and 851 were coordinated with the USFWS and in accordance with the biological opinion issued by that agency. USFWS documents cited were made available for review in the DOE reading rooms during the public comment period for the Draft LLNL SW/SPEIS.

16.03 Commentors expressed a number of concerns regarding the identification of relevant species at each site, the level of detail in which impacts are evaluated and the adequacy of mitigation measures to prevent impacts. Some of the specific concerns included the following:

- Impacts from facility D&D.
- Impacts on different species from radiological and chemical releases.
- Impacts of new construction on threatened and endangered species. Description of how operations are managed to ensure the habitat and breeding of plants and animals is not disrupted.
- Qualifications and level of independence of wildlife biologists who oversee implementation of mitigation methods.

Commentor questioned why the LLNL SW/SPEIS only analyzed a handful of the 124 species listed in Table E.2–1. The LLNL SW/SPEIS only discusses in detail the California red-legged frog, California tiger salamander, and the Alameda whipsnake. Consequently, failure to review the remaining special status species results in an incomplete biological analysis. Commentor contended that the LLNL SW/SPEIS should study the impacts of the proposed activities on the peregrine falcon, a recently de-listed species, but one that is being monitored carefully.

Response: *The LLNL SW/SPEIS analyzed in detail three federally listed species that are identified as threatened, endangered, or proposed for listing under the provisions of the Endangered Species Act. A number of additional bird species are included in Tables 4.9.3–1 and E.2–1 that are protected by the Migratory Bird Treaty Act. LLNL provides protection for these birds by ensuring that their nests are not damaged, and no take occurs of eggs, young, or adult birds. Information on migratory birds is provided in Section E.1. The activities of the LLNL biologists are overseen by the NNSA Livermore Site Office and are coordinated with the USFWS. Additional information related to this response can be found in Comment Response 16.02. The peregrine falcon has been de-listed as noted by the commentor. Neither nesting nor foraging peregrine falcons were observed during a raptor study conducted at Site 300 in 2002 (Bloom 2002). The study's*

author noted that it is unlikely that peregrine falcons will nest at Site 300, because only small cliffs are present at the site, while this species prefers to nest on large cliffs.

- 16.04** Commentor requested that DOE describe any other comparable grasslands to Site 300 and the value of this land. Alternatives should be analyzed for explosive testing sites. A cost-benefit analysis with alternatives should be completed to see if other options are feasible.

Response: *DOE/NNSA does not have any proposal to move Site 300 operations to another location or to close that site. The range of reasonable alternatives developed within this LLNL SW/SPEIS maintains LLNL's core mission and operations and responds to the programmatic purpose and need for critical support of NNSA's Stockpile Stewardship Program. Therefore, a search of comparable grasslands to Site 300, and related cost-benefit analysis, is outside the scope of analysis for this LLNL SW/SPEIS. Appendix E, Section 2.1 and Section 2.2 have been updated concerning newly proposed critical habitats for the California red-legged frog and the California tiger salamander.*

- 16.05** Commentor requested that DOE provide possible impacts to the environment and special status species from daily and weekly explosives testing. These tests could cause direct mortality of California red-legged frogs, Alameda whipsnakes, and California tiger salamanders, as well as some birds protected under the *Migratory Bird Treaty Act*. There is little discussion of the impact of the explosions on these species. Diurnal raptors (e.g., northern harrier, black-shouldered kit, ferruginous hawk, and red-tailed hawk) that forage directly over the facilities will be the most vulnerable to flying debris and shock overpressure. Commentor questioned the potential impact on these bird populations and their habitat, and availability of surrounding habitat. Commentor expressed concern regarding the impact of facility operation on species that forage and travel at night.

Response: *The Proposed Action includes no increase of outdoors explosive testing and therefore poses no additional risks. Site 300 facilities have operated for years with minimal impact to these species. In addition, some experiments that have traditionally been performed at the three operational firing tables are now conducted in the Contained Firing Facility. Operations at the Livermore Site and Site 300 occur primarily during daylight hours, minimizing the impact to species active at night. LLNL operations pose minimal impact to protected species that forage and travel at night as discussed in Appendix E (Ecology and Biological Assessment).*

17 AIR QUALITY

- 17.01** Commentor expressed concern regarding tritium releases and mitigation measures to prevent or minimize additional contamination at Site 300. Commentor questioned why there is an assumed release of tritium for the No Action Alternative, but there were no releases in 2001. Commentors stated that the community was assured in 1992 that no tritium would be used in shots. Please correct the inconsistency regarding tritium emissions from hydroshots, given in Section 3.4.7 and those in the 2003 LLNL

document. Commentors questioned why the Livermore Site has tritium monitors, but Site 300 does not. Please explain this discrepancy.

Several commentors expressed concern regarding tritium impacts due to encroachment. Regarding tritium shots at Site 300, the LLNL SW/SPEIS should discuss for each alternative:

- How many shots are planned per year?
- Where will these shots be conducted?
- How much tritium will be in proposed shots? What are the byproducts? How much depleted uranium will be used?
- Impacts to human health and environment
- Impacts to groundwater
- What disposal method will be used for all different types of debris?
- Have they undergone environmental modeling?
- How are these activities reported?

Response: *Comment Response 17.02 addresses mitigation measures, long-term effects, and past releases.*

There were no releases of tritium from shots at Site 300 in 2001 because no shots using tritium were performed. However, such shots have been performed in the past at Site 300. Such shots remain part of the programmatic mission of the Site. It is expected that tritium shots will be performed in the future as part of this mission, therefore, tritium releases were assumed for both the No Action Alternative and the Proposed Action. Section 3.4.7 describes the tritium emissions from shots for the Reduced Operation Alternative. This is a reduction from tritium emissions for the No Action and Proposed Action alternatives. The emissions presented in that section for the various alternatives are conservative estimates based on the best available information.

Tritium monitors at the Livermore Site monitor the long-term continuous release of tritium from stationary sources, such as the Tritium Facility. Tritium releases from Site 300 would be associated mainly with shots. The quantity of releases from these shots are well known based on past experience.

The number and size of individual shots each year depends on programmatic considerations. As noted in Section 5.2.8, firing tables at Buildings 812 and 850 will not be used for tritium experiments. The firing table at Building 851 is the only open-air facility that would use tritium. It is expected that tritium would also be used in shots in the Contained Firing Facility. As noted in Sections 5.2.8 and 5.3.8, up to 20 milligrams (194 curies) of tritium may be released annually for the No Action and Proposed Action alternatives. As given in Section 5.4.8, up to 15 milligrams (145 curies) of tritium may be released annually for the Reduced Operation Alternative. Tritium released to the atmosphere is assumed to be tritiated water. The amount of depleted uranium released for each of the alternatives is expected to be similar to that released in recent years. As shown in Table 4.10.5–1, the depleted uranium released during 2001 was 0.065 curies,

which represents the largest annual release during the 6-year period ending in 2003 for which information is available. Utilizing this value was a conservative assumption for impact analyses. Human health impacts from Site 300 shot releases are described in Sections 5.2.14.2, 5.3.14.2, and 5.4.14.2. They are discussed further in Appendix C, Section C.4.2. Impacts to the environment are described in Sections 5.2.8.2, 5.3.8.2, and 5.4.8.2. Both the human health impacts and environmental impacts are small. Because the atmospheric concentrations of tritium are orders of magnitude below regulatory standards, these releases are expected to have an insignificant impact on groundwater. This impact assessment considers encroachment as appropriate.

Appendix B, Section B.1.4, describes radioactive and hazardous waste management facilities at Site 300. These facilities include Building 883 Container Storage Area (hazardous wastes), Building 804 and Building 883 Waste Accumulation Areas (low-level radioactive wastes), the Explosive Waste Storage Facility and the Explosive Waste Treatment Facility at Building 845. Appendix A, Section A.3.2.21 describes the handling of debris. Low-level radioactive waste and chemically hazardous waste are segregated. The former is placed in containers and transported to the Building 804 waste staging area. All nonexplosive contaminated hazardous waste is transported and stored at Building 883 prior to shipment to Livermore Site for treatment or to an offsite disposal facility. Washdown water from the Contained Firing Facility is diverted to a holding tank, filtered and reused. If sampling of the water indicates the necessity for its disposal, it would be transferred to the Livermore Site for discharge to the sanitary sewer, if parameters are within acceptable limits, or transferred to the Radioactive and Hazardous Waste Management Complex for appropriate disposal. All of the LLNL areas have undergone hazard assessments. Appendix B contains the environmental impacts of LLNL Waste Management activities and refers to other site documents on this subject (e.g., see Section B.1.3). Section 5.1.8 describes environmental monitoring and the annual National Emission Standards for Hazardous Pollutants (NESHAP) report.

LLNL waste management activities are conducted in accordance with applicable requirements as described in Appendix B.

- 17.02** Commentor expressed concerns regarding tritium contamination and mitigation measures to prevent or minimize additional contamination at the Livermore Site. DOE should assess the long-term effects and impact of past tritium releases from LLNL.

Commentors expressed specific concerns regarding tritium activities at the Livermore Site:

- Is the proposed increased level of tritium activities leading to an “unavoidable” increase in airborne emission levels of tritium?
- Can HEPA filtration efficiency of 99.97 percent be improved? Can the proposed overall increased level of radionuclide activity be met with constant or reduced airborne waste emission levels?
- What airborne sources of background radiation exist which yield a dose level of 200,000 times greater than emissions from LLNL?

- The statistics for comparing radiation dose from LLNL operations versus background sources as listed in Table 4.16.2.1–1 do not appear to be logical. What population base should be used to compare the columns of millirem to person-rem? For example, does the atmospheric maximally exposed individual (MEI) dose of 0.12 millirem compare to 0.085 millirem, i.e., a 1.7 person-rem population dose for a population of 20,000?
- Table 4.16.2.2–1 indicates a continuing increase in worker dose from a level of 6.9 person-rem in 1998 to a level of 28.0 person-rem in 2002. How does this coincide with a decreased risk versus the general population? Why is the level increasing? Can the level be expected to increase further with the proposed activity levels?
- What activities or efforts will be implemented over the next 10 years to control and minimize the release of toxic materials? What type of monitoring is in place or will be in place relating to potential releases of toxic materials?

Response: *Specific examples of mitigating tritium releases to the environment are described in Appendix A, Section A.2.2.31, and include engineered ventilation system to protect workers and to control the release of radioactive material, maintenance of pressure gradients so that air flows toward (rather than away from) internal building areas of increasing contamination potential, and the quick dilution of tritium through two 100 foot high continuously monitored stacks. In addition, the Tritium Facility Modernization project includes cleanup, decontamination, and removal of tritium contaminated equipment (see Appendix A, Section A.2.3.11).*

The Proposed Action does not include an increase of tritium releases above historical levels. Section 4.10.5 describes historical tritium releases. Impacts (the majority of which are from tritium) in terms of dose from all radioactive releases for the period 1998-2002 are indicated there. It is shown that these impacts are far below regulatory limits. Impacts from earlier years can be found in site documents such as Site Annual Environmental Reports and NESHAP Annual Reports.

The HEPA filters and their operation is discussed Appendix D, Section D.2.2.2. LLNL uses commercially available HEPA filters and would consider improved HEPA filter designs if available for removal of particulates. HEPA filters remove particulates but not gases.

Population doses received from LLNL releases are approximately 200,000 times less than that received by the population from background radiation (see Section 4.10.5.2). This includes all background exposures such as radon, medical exposures, food consumption, cosmic radiation, terrestrial radiation, and weapons test fallout (see Table 4.16.2.1–1).

The population dose (person-rem) in Table 4.16.2.1–1 was calculated for the entire population within 50 miles of each Livermore Site, approximately 7 million people. The MEI dose (millirem) and population dose (person-rem) are not meant for comparison with each other. The MEI dose represents a dose to a hypothetical person permanently

located at the offsite location of maximum exposure and thus represents a dose greater than any individual would receive. The MEI dose (0.33 millirem per year) is 0.4 percent of the DOE standard of 100 millirem per year for the general public. It is unlikely that the low population dose resulting from site emissions would increase the number of cancers occurring naturally (approximately 11,000 per year) within the entire 7 million person population surrounding LLNL.

Worker dose can be expected to increase with increasing LLNL activities. The increase in activities since 1998 is reflected in the number of workers included in Table 4.16.2.2–1 for years subsequent to 1998. However, worker dose is also subject to year-to-year variations; the worker dose in 1997 was 22.1 person-rem. The worker dose is expected to be approximately 89, 93, or 38 person-rem for the No Action, Proposed Action, or Reduced Operation Alternatives, respectively (Appendix C, Table C.3.3–1).

The dose to the general population from proposed activity levels are expected to be approximately 1.8 person-rem from the Livermore Site and 9.8 person-rem from Site 300 (Table C.3.3–1). These doses are comparable to doses seen within the period 1998–2002 (Table 4.10.5–2). Chapter 4, Section 4.10.4 describes programs at LLNL that control and minimize the release of toxic materials. Chapter 4, Section 4.16.1 describes programs implemented at LLNL to monitor and protect the health of workers.

- 17.03** Commentor stated that the LLNL SW/SPEIS should quantify, for each criteria pollutant, the reasonably foreseeable construction emissions for the fully evaluated alternatives. Quantifying reasonably foreseeable construction emissions informs the public and decisionmakers on the project's air quality impacts and helps to identify appropriate mitigation at each for nonattainment pollutant. The LLNL SW/SPEIS should evaluate the feasibility of mitigation measures to reduce construction emissions and include appropriate commitments in the NEPA Record(s) of Decision.

Commentor stated that all D&D activities have not been thoroughly taken into consideration. The commentor stated that the LLNL SW/SPEIS should discuss all air quality and contamination issues related to D&D. Potential adverse air quality effects from D&D waste transport and eventual disposal facilities should be discussed.

Commentor stated that in Table 3.6–1 the only significant non-radiological airborne pollutant described is carbon monoxide. On page 4.7-7, it is indicated that vertical mixing to dilute pollution is not conducive with the topology of the Livermore Valley. In general, the valley is a nonattainment area for compliance with particulate pollution. The number of exceedances has increased each year as seen in Figure 4.10.2–2. The commentor expressed the following concerns regarding air quality:

- What effects on the outside air quality will occur by the generation of debris particulates (e.g., PM_{2.5} and PM₁₀ in Table 4.10.1–1) during demolition processes?
- How long will the effects last?
- Standard practices are indicated in Section 5.2.8.1 and Appendix B for D&D.

Will these activities be conducted as guided by the as low as reasonably achievable (ALARA) principle?

- To gauge the appropriate level of regulation consistent with particulate generation (Section 5.1.8.1), will there be onsite monitoring of particulate pollution?
- Which respiratory effects are magnified in the general population from an increase in airborne particulates?
- How do these activities differ from the airborne particulates generated by other outside activities in Livermore, e.g., ongoing housing developments?

Response: *As stated in Section 5.1.8, the Bay Area Air Quality Management District's (BAAQMD) approach to analyses of construction impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions. At a minimum, all construction projects must comply with appropriate feasible control measures designed to reduce emissions of respirable sized particulates (PM₁₀) from construction activities as set forth by the BAAQMD. Basic Measures would be implemented at all construction sites, regardless of size; Enhanced Measures would be implemented at larger construction sites (greater than 4 acres) where PM₁₀ emissions generally would be higher; and Optional Measures may be implemented if further emission reductions are deemed necessary by local agencies. Chapter 5, Sections 5.2.8, 5.3.8, and 5.4.8 have been updated to include air conformity analysis for construction activities.*

The LLNL has active pollution prevention (Appendix O) and mitigation programs (Section 5.6.9) designed to reduce air emission during construction, operation, maintenance, and facility D&D. Construction is defined to include building, renovating, modifying, painting, decorating, repairing, or demolishing of facilities and structures.

Fugitive dust is controlled by water spraying of disturbed areas and covering exposed piles of excavated material; engineering controls, devices, and work practices during work with asbestos to isolate the source of asbestos and prevent fiber migration. In addition, the LLNL mitigation program requires that fuels must meet the requirements of the Clean Air Act and Power Plant and Industrial Fuels Use Act, and applicable DOE orders, together with the requirements imposed by both state and local agencies aimed at reducing emissions of criteria air pollutants and diesel particulate matter. In addition, the State of California is leading the Nation in requirements for effective control of emissions and exposure from the combustion of diesel fuel. LLNL would also continue to require that construction equipment and vehicles be inspected daily for leaks of fuel, engine coolant, and hydraulic fluid; and architectural coatings must comply with strict air district regulations on organic content. Finally, LLNL has a transportation systems management program that provides and promotes alternative, environmentally responsible, options for employee commuting (including construction subcontractors), assists LLNL in complying with transportation-related Clean Air Act legislation, and resolves congestion management issues. LLNL would continue this program.

LLNL would also continue to include standard measures for controlling pollution as part of every construction subcontract. To aid in the identification of appropriate mitigation

measures during project planning, LLNL requires that subcontractors complete a project-specific task identification process list for all construction projects. This list, a questionnaire listing typical concerns and hazards, helps subcontractors identify potential topics and requirements related to air resource protection to be addressed in project-specific compliance plans and during facility construction. In addition, the LLNL Environmental Protection Department, Hazards Control Department and Plant Engineering staff review all designs and provide guidance on construction projects, review the task identification process list prior to commencing construction, and routinely inspect construction work sites to ensure adherence to project-specific requirements. LLNL further requires its subcontractors to obey all applicable Federal, state, and local regulations. These measures are designed to ensure compliance and minimize the potential for contamination or unique exposure.

With respect to D&D activities, as discussed in Sections 3.2.10 and 3.3.19, D&D actions are included in the alternatives evaluated in this LLNL SW/SPEIS. Chapter 5 contains impacts related to D&D. However, the air quality impacts from disposal operations that are not within the LLNL region of influence are beyond the scope of this LLNL SW/SPEIS; those facilities are covered by either site-specific NEPA documents and/or permitting documentation. With regard to radiological contaminants associated with D&D, there would be no significant air quality impacts from radioactive releases during transportation (see Appendix J).

- 17.04** Commentor expressed concern regarding the amount of radioactive and hazardous contamination released into the air from LLNL. The air quality in the San Joaquin Valley and Alameda County is among the worst in the Nation. The LLNL SW/SPEIS should acknowledge this and explain the incremental, cumulative, and synergistic impacts of releases for current and future LLNL activities. The LLNL SW/SPEIS should evaluate the feasibility of mitigation to reduce radiological emissions to the extent practicable at the Livermore Site and Site 300. Should this mitigation be feasible, include appropriate commitments in the NEPA Record(s) of Decision. Commentors expressed concern about future power plants in the region.

Response: *The air quality in the San Joaquin Valley and Alameda County is discussed in detail in Sections 4.10.2.1 and 4.10.2.2. Nonattainment pollutants are identified and local monitoring data is provided, along with descriptions of the very stringent “no net increase” and “all feasible control measure” programs designed to bring the regions into attainment. The state and local air toxic control and assessment programs are also detailed. These air quality control programs are significant in that they limit the impact of LLNL activities as well as the cumulative growth in emissions in each of the air basins, which is also discussed in the air quality impact sections.*

The incremental and cumulative impacts of radiological releases are explained in Sections 5.2.8.2, 5.3.8.2, and 5.4.8.2. These sections explain that the incremental impacts are very small and that there are no cumulative impacts. There are no expected synergistic impacts from radiological releases.

As discussed in Chapter 4, Section 4.10.5, LLNL reduces radiological emissions to the extent practicable through a number of programs which include work practices and control devices and identifies those in its planning tools, such as Integration Work Sheets, Facility Safety Plans, and Operational Safety Plans. As discussed in Chapter 5, Section 5.6.9, LLNL has mitigation measures in place governing construction activities and fuel use to minimize air emissions including: water spraying of disturbed areas and covering exposed piles of excavated material; engineering controls, devices, and work practices during work with asbestos to isolate the source of asbestos and prevent fiber migration; and requirements that construction equipment and vehicles be inspected daily for leaks of fuel, engine coolant, and hydraulic fluid.

The LLNL Integrated Safety Management System integrates environmental safety and health protection to the public, workers, and environment into management and work practices. The LLNL Pollution Prevention Program is designed to minimize pollutant releases to all environmental media from all aspects of the site's operations. New processes and experiments are reviewed to consider possibilities for mitigation actions such as chemical substitutions, process changes, and material recycling. New projects are designed with the goal of minimizing or mitigating potential environmental impacts through project modifications at the design stage. The Site Annual Environmental Reports (environmental protection information) and Appendix C of the LLNL SW/SPEIS discuss these mitigation programs further.

For information regarding future power plants in the region, see Comment Response 23.02.

- 17.05** Commentor questioned the derivation of Maximum Exposed Individual (MEI) dose in Section 3.6.5 for radiological air emissions from normal operations at the Livermore Site and Site 300.

Response: *The methodology used to derive the MEI is described in Section 5.1.8 and more fully in Appendix C, Section C.4.2.2. The site-wide MEI dose is the sum of the dose contribution from each site facility at the offsite location of maximum exposure, as determined in the 2001 (baseline year) NESHAP report. A facility's contribution to the MEI was incremented if additional releases above those of the baseline year were included in any of the alternatives. The most significant increment to an existing facility at the Livermore Site was from increases in Building 331 tritium releases for each of the alternatives; the dose increment was determined by scaling the baseline MEI dose component by the ratio of the tritium expected to be released for that alternative to that of the baseline year. In addition, the dose from NIF (not a part of the baseline dose) was calculated using the CAP88-PC computer code as described in the above referenced sections of the LLNL SW/SPEIS. The location of the Livermore MEI changed from the Credit Union to the site boundary due east of the NIF stack due to the addition of releases from NIF. The site-wide MEI value at the Credit Union for all facilities except NIF was added to the MEI dose from NIF. This increases the conservatism of the estimated dose to the MEI. The MEI dose at Livermore is not sensitive to the choice of*

baseline year because the major contributions (from Tritium Facility and NIF releases) to this dose were calculated specifically for the releases associated with each alternative.

The MEI dose from the firing table at Building 851 was calculated in a similar manner. The baseline dose from that firing table was chosen as 2001, the year of maximum MEI dose during the 5-year period of 1998-2002. The baseline dose was incremented for the expected tritium release for each of the alternatives (the baseline year did not include any tritium releases, see Comment Response 17.01). The tritium component of the MEI dose from the firing table at Building 851 was calculated using the CAP88-PC computer code as described in the referenced LLNL SW/SPEIS sections.

- 17.06** Commentor expressed concern regarding shots on open air firing tables at Site 300. The LLNL SW/SPEIS should for each alternative, address what pollutants are released during shot testing, the proposed methods of disposal for shot debris, the feasibility of reducing the number of open air shots, and the reasonably foreseeable impacts on environmental restoration activities.

Response: *The radiological releases and debris disposal methods are described in Comment Response 17.01. Appendix A, Section A.3.2, describes the debris and the proposed methods of disposal for each of the firing tables. The number of open air shots would be determined by programmatic considerations and the chosen LLNL SW/SPEIS alternative. Use of the Contained Firing Facility would reduce the emissions from open air shots, because the effluent from each Contained Firing Facility shot would be kept within the facility.*

- 17.07** Commentor expressed concern regarding lack of discussion of controlled burns at Site 300. Because the EPA has designated the region as out of compliance with their air quality guidelines, commentor questioned the amount of contamination released during controlled burns and suggested alternative control measures (i.e., mowing, grazing by goats). Because Site 300 is also contaminated with tritium and uranium, release of these radioactive elements by fire should be discussed. Commentor requested that the LLNL SW/SPEIS consider a massive wildfire that cannot be controlled by a present fire fighting capability.

Response: *LLNL conducts controlled burns at Site 300 to mitigate the risk of wildfires as discussed in Chapter 4, Section 4.10.4.7. Included in this discussion is the rationale for conducting controlled burns versus grazing, mowing and herbicides. In general, LLNL impacts on tritium concentrations in vegetation at Site 300 are insignificant (LLNL 2003l). No indication of uranium in Site 300 vegetation has been found; therefore, no impact from uranium released during a fire is expected. Concentrations of uranium in Site 300 soils are generally representative of background. Areas of uranium concentrations above background are present near some of the firing tables; tritium contamination can be associated with areas of elevated groundwater concentrations. Controlled burning at Site 300 prohibits the build up of vegetation. As discussed in Appendix D, a range of reasonable bounding accidents was analyzed. Although an accidental wildfire was not a credible bounding accident, Appendix D presents impacts*

from fires affecting specific facilities, as appropriate. Appendix I includes a summary of emergency planning and response activities established to mitigate the consequences of major emergencies and natural disasters at LLNL.

18 WATER

18.01 Commentor questioned how increases in nuclear and hazardous materials will impact groundwater. Commentor expressed concern regarding elevated levels of tritium in Livermore groundwater wells because Livermore is a closed water basin and depends on deep wells for water. Some commentors requested that LLNL discuss waste management plans and water quality monitoring to prevent groundwater contamination from the EMPC and the existing high explosives process area. Commentor also questioned:

- What are the current levels of tritium in water aquifers in all deep wells situated in Livermore Valley?
- Were wells in the greater community tested or monitored for tritium levels? When was the last testing? How frequently are they tested?
- Were all significant sources of water tested for tritium regardless of distance from the lab?
- Have known plumes tested higher or lower for tritium levels?

Response: *No major impacts to groundwater are identified from the proposed increases in nuclear or hazardous materials as discussed in Chapter 5, Section 5.3.9.2. LLNL implements both administrative (e.g., training to implement emergency response actions to expeditiously clean up spills) and engineered (e.g., use of secondary containment systems) controls to minimize the impact of accidental releases.*

With regard to tritium in groundwater, LLNL performs both routine monitoring of onsite and offsite sampling locations, including wells, in accordance with DOE Order 450.1 Environmental Protection Program and DOE Order 5400.5 Radiation Protection of the Public and the Environment as discussed in Chapter 4, Section 4.11. Groundwater monitoring with regard to CERCLA requirements is discussed in Section 4.17. Results of the routine sampling are reported each year in the Site Annual Environmental Report for LLNL (LLNL 2003l). Tritium activity levels in known plumes have decreased over time, as discussed in Section 4.11.3.4. This monitoring program adequately characterizes the effect of LLNL operations on the aquifer.

Chapter 4, Sections 4.11 and 4.15 discuss programs implemented at Site 300 for monitoring groundwater, surface water, and controlling the use of hazardous materials. EMPC would be included in these monitoring programs and its operations would be implemented by trained personnel following approved procedures. EMPC operations would also be included in the LLNL's procedures for compliance with 40 CFR § 112.3 EPA, "Protection of the Environment, Oil Pollution Prevention, Requirement to Prepare and Implement a Spill Prevention, Control, and Countermeasure Plan."

- 18.02** Commentor requested that the LLNL SW/SPEIS address the impact of additional radiological emissions on surface water. Commentor expressed concern regarding tritium contaminated rainfall. Commentor requested analysis of the potential impact on groundwater from using the proposed materials on NIF. Commentor asked whether the existing groundwater monitoring network would detect these materials. Commentor stated that impacts to groundwater from underground storage tanks should be evaluated. Commentor questioned why release potential to groundwater and surface water would not increase when the use of radioactive and hazardous materials is increased.

Response: *Radiological emissions for all alternatives analyzed are well within historical ranges. The LLNL SW/SPEIS discussed the occurrence of radionuclides in rainwater and stormwater in Chapter 4, Section 4.11.2. As discussed in Appendix C, LLNL implements programs to provide safe working conditions for employees and to limit exposures of the general public in the vicinity to hazardous and radioactive materials. These programs are conducted in accordance with regulatory requirements and include implementation of administrative and engineered controls to minimize potential releases as well as surveillance monitoring of the environment and reporting of exposure assessments. For instance, impacts to groundwater from leaking underground tanks are not expected since LLNL complies with underground storage tank regulations that require the use of tank and piping primary and secondary containment, detection and monitoring systems, and corrosion protection. Groundwater monitoring is discussed in Comment Response 18.01.*

- 18.03** Commentor expressed concern regarding the impacts LLNL would have on water consumption and suggested evaluating an alternative proposal that discontinues the Terascale Simulation Facility.

Response: *Water consumption is discussed in Chapter 4, Section 4.14 and Chapter 5, Sections 5.1.12, 5.2.12, and 5.3.12. Increases in consumption are within the existing capacity of the water distribution system. As explained in Chapter 3, Section 3.2.3, the Terascale Simulation Facility is currently under construction and is scheduled to be operational in FY2005. The Terascale Simulation Facility will support the Stockpile Stewardship Program. The Reduced Operation Alternative assesses operation of this facility at 60 percent capacity. Any alternative that would discontinue the Terascale Simulation Facility is considered unreasonable.*

- 18.04** Commentor stated that Zone 7 would need to assess fees if there are increases in impervious areas. Fees are collected for any development creating new impervious areas that would contribute runoff to Zone 7's flood control facilities. Increased runoff from impervious areas will most likely affect Zone 7 flood control facilities Line P (Arroyo Seco) and Line P-1 (Arroyo Las Positas) adjacent to the Livermore Site. A hydraulic study should be performed to show that additional runoff will not have an adverse effect on the 100-year water surface elevation in Zone 7 facilities.

Response: *Because of the D&D of existing facilities, the Proposed Action does not include any net increase in impervious areas within Zone 7 flood control jurisdiction and therefore would not have an adverse effect on the 100-year water surface elevation in*

Zone 7 facilities. Appendix A, Section A.2.4.18 describes D&D of existing facilities included in the Proposed Action.

19 NOISE

No comments were received related to noise.

20 TRAFFIC AND TRANSPORTATION

- 20.01** Commentors questioned why the LLNL SW/SPEIS did not consider accidents during transport. What is the possibility of a transportation accident on any given road? Please provide detailed information on the exact corridors and anticipated amounts of materials of all types to be transported along them. Corridors and anticipated transit should consider both accesses to and from LLNL. The LLNL SW/SPEIS should also provide route-specific data, type of material and packaging used, maximum allowable quantities shipped as well as recent population and truck accident data. DOE should identify shipments that would require DOE security escorts. In addition, commentor questioned the frequency, schedule, and security of shipments. Commentor stated that the LLNL SW/SPEIS should provide an estimate of the number of highway route-controlled quantity shipments projected from LLNL to Waste Isolation Pilot Plant (WIPP). Commentor questioned the risk of an accident or terrorist attack from a container breach of one of these shipments. Commentors were concerned about transportation of waste across the country specifically to Hanford and the Savannah River Site.

The LLNL SW/SPEIS should discuss potential exposure to truck drivers, other transportation workers, and vehicles in traffic. Commentor expressed concern regarding the amount of latent cancer fatalities (LCFs) involving transportation and questioned the LCFs for each alternative. The calculated LCFs for the No Action and Proposed Action alternatives are above EPA's range of acceptable cancer risk standards. Commentors suggested that DOE provide more information and review on radiological and hazardous waste shipments.

Response: *The methodology to analyze the radiological impacts of traffic and transportation are presented in Chapter 5, Section 5.1.11, including the use of TRAGIS and RADTRAN 5. Bounding transportation accidents are presented in Chapter 5, Section 5.5, which is supported by Appendix D and Appendix J. The presentation provides probabilities of occurrence where they are available and the number of shipments.*

Section 5.1.11 describes the methodology used to determine transportation impacts. For purposes of analysis, NNSA used the computer code TRAGIS to identify routes and route demographics for shipments of radioactive materials and wastes. The code determines routes based on criteria supplied by NNSA and takes into account special provisions for highway route-controlled quantities. However, the routes that are ultimately selected would depend on conditions at the time of shipment and cannot be predicted in advance. Shipments by commercial carriers are not under the control of NNSA and cannot be predicted. Therefore, the LLNL SW/SPEIS does not identify any specific routes. The

timing and frequency of the shipments would be determined by operational constraints and cannot be predicted at this time. NNSA would follow all internal procedures and Federal and state regulations for all shipments to ensure safety and security.

Doses to truck drivers are presented in Table J.3–1 in Appendix J, for incident free transportation. As shown in that table, the maximum collective dose to drivers would be less than 1 person rem in all cases evaluated. This dose would be well below regulatory limits imposed by DOE and the Nuclear Regulatory Commission (NRC), as appropriate. Health and safety impacts to workers are discussed in Appendix J.

Regarding risk numbers, commentor has compared quantities that are not comparable. The number of LCFs from incident-free transportation reported in the LLNL SW/SPEIS is 5×10^{-3} per year for the Proposed Action. The EPA risk range for cleanup of Superfund sites is 10^{-6} to 10^{-4} over a lifetime. The EPA values are equivalent to the probability of an individual getting cancer (cancer incidence, not necessarily cancer fatality). The value provided for LLNL transportation under the Proposed Action is an estimate of the number of the exposed individuals (of a very large population) who will get a fatal cancer. Because the number of individuals estimated to die from cancer under the Proposed Action transportation impacts would be very much less than one (5×10^{-3} LCFs), one could conclude that no one in the exposed population is expected to incur a fatal cancer.

In preparing the LLNL SW/SPEIS, NNSA examined the shipment history of LLNL with respect to hazardous and radioactive shipments and decided to specifically analyze those shipments that are of most interest and present the greatest risk. Without penetrating radiation, nonradioactive hazardous shipments would have minimal impact to the public unless there is some accident that releases the contents. The numbers of such shipments to or from LLNL are extremely small compared to the numbers on the highways from all other causes. Radioactive shipments have the potential to impact members of the public and are more specific to LLNL (although not unique) when compared to the baseline of shipments on the U.S. highways. However, the majority of radioactive shipments examined were very small packages shipped by mail or commercial express carriers, containing extremely small quantities of radioactivity. Any quantitative analysis of such shipments would yield extremely small values. Accordingly, DOE decided to report the total numbers of hazardous (hazardous and radioactive), as indicated in the comment, but to quantitatively analyze only those of special interest: the larger radioactive shipments, including special nuclear material, low-level waste, tritium, and small amounts of miscellaneous radioactive material. The results of this analysis of current operations are found in Chapter 5, Table 5.2.11.2–1.

Current plans are that transuranic waste drums at LLNL would be shipped directly to WIPP. WIPP is located 26 miles east of Carlsbad in southern New Mexico, and its operations are not within the scope of the LLNL SW/SPEIS. WIPP operation was evaluated in the Waste Isolation Pilot Plant Final Supplemental Environmental Impact Statement (DOE 1997e). Appendix J analyzes annual transportation of waste shipments to WIPP, including the number of shipments.

For issues associated with terrorism concerns, see Comment Response 30.01.

- 20.02** Commentor stated that the LLNL SW/SPEIS only considers accidents involving transport of LLNL vehicles and personnel, failing to address waste stream transportation carried out by private contractors and vendors. Commentor questioned what proportion of shipments will be handled by commercial contractors and what the impacts of choosing commercial contractors would be versus lab employees.

Response: *Although data regarding the proportion of shipments by DOE truck versus commercial vehicles is not available or necessary for environmental analyses, the information that follows is relevant to the commentor's question. NNSA generally transports transuranic (TRU) waste and special nuclear material in DOE vehicles with DOE drivers; however, most other material is transported by commercial carrier. NNSA ensures that commercial carriers are qualified and adhere to Federal and state regulations. The LLNL SW/SPEIS analyzes transportation impacts irrespective of the particular carrier.*

NNSA selected bounding transportation accidents to present. The environmental impacts from bounding transportation accidents are presented in Chapter 5, Section 5.5, which is supported by Appendix J and Appendix D. As reported in Table J.4–2, NNSA examined transport of special nuclear material and TRU waste, which are generally transported by DOE drivers in DOE vehicles. Tritium, may be transported by DOE or commercial carrier depending on the shipment. Low-level waste is generally transported by commercial carriers. Therefore, the LLNL SW/SPEIS does analyze accidents involving private contractors and vendors. The bounding accidents analyzed in the LLNL SW/SPEIS are independent of the shipper.

- 20.03** Commentor stated that the Circulation Element of the recently adopted 2003 General Plan identifies several proposed transportation improvements in the vicinity of LLNL. Specifically, road improvements, such as adding lanes, will be made along the Vasco Road Interchange and the Greenville Interchange. The LLNL SW/SPEIS does not adequately address the traffic impacts of the Proposed Action or the alternatives. Traffic is expected to increase by 1,100 daily trips over the No Action Alternative, however, the LLNL SW/SPEIS does not distribute the project trips to the roadway network to determine significant impacts. There are roadways and intersections providing primary access to the Livermore Site that have poor levels of service under existing conditions. Specifically I-580 near Vasco Road, and Vasco Road near I-580 have existing and forecast future congested traffic conditions. The city of Livermore requests the LLNL SW/SPEIS discuss the following traffic impacts:

- What are the existing and future levels of service on I-580 between First Street and Grant Line road both and with and without the Proposed Action?
- What are the existing and future intersection levels of service along Vasco Road and Greenville Road between I-580 and East Avenue both with and without the Proposed Action?

- What are the impacts of the Proposed Action to I-580, Vasco Road, Greenville Road and the signalized intersections?
- What traffic improvements are proposed to mitigate the congested conditions resulting from the Proposed Action?
- What affect does non-auto transportation (e.g., bus, bike, pedestrian, ACE) have on reducing auto traffic impacts?
- What is the Proposed Action's fair share mitigation costs relating to transportation impacts and what funding is available? The city has calculated an estimated fair share contribution towards transportation improvements based on information provided in the Draft LLNL SW/SPEIS. With an estimated 6.6 percent of future traffic growth on Vasco Road attributed to the Proposed Actions, a preliminary fair share contribution or improvements to Vasco Road and the Vasco Road Interchange is estimated at \$3.1 million.

Response: Chapter 5, Section 5.3.11 states that the Proposed Action would increase employment at LLNL by approximately 500 jobs. This represents a total increase of employment of approximately 5 percent in the Livermore Site workforce. This is a small fraction of the current traffic level near LLNL. The incremental contribution from the Proposed Action over the No Action Alternative would be small; therefore, no additional analysis is needed to meet NEPA requirements. As discussed in Section 4.13.2 of the LLNL SW/SPEIS, I-580 carries approximately 120,000 vehicles per day and experiences significant congestion during peak commute hours in the Livermore vicinity. Road improvements near the LLNL site are being considered and will be required in the future, regardless of decisions that would be made regarding this LLNL SW/SPEIS. The city of Livermore is developing a major traffic model to forecast future traffic volumes and impacts. Such modeling will assist in determining the specific road improvements that will improve traffic flow. Such road improvements could include modifications to interchanges, road widening, new roads, and adjustments to signalization. Funding issues associated with any future road improvements are beyond the scope of the LLNL SW/SPEIS. It is acknowledged that non auto modes of transportation (e.g., bus, bike, pedestrian, ACE) would reduce traffic and congestion; however, assessing the impacts of such modes of transportation is beyond the scope of this analysis.

- 20.04** Commentor expressed concern regarding shipments of explosive materials to and from Site 300, especially along the unimproved Corral Hollow Road. Commentor questioned impacts from transport including radiation exposure, accidents, and terrorist activity.

Response: Chapter 5, Section 5.5.5.3 presents the impacts from explosives transportation accidents. As explained in that section, potential impacts include death or severe injury to the driver(s) and passengers in adjacent vehicles. This conclusion remains valid for any road in which an accident might occur, including Corral Hollow Road. The environmental impacts from transport of radioactive materials are presented in Chapter 5, Sections 5.2.11, 5.3.11, and 5.4.11, which are supported by Appendix J. Bounding transportation accidents are presented in Chapter 5, Section 5.5, which is supported by Appendix D and Appendix J. The releases of radioactive and chemical materials from

spills are bounded by these analyses. For information regarding terrorism, see Comment Response 30.01.

- 20.05** Commentor expressed concern regarding the possibility of replacing Transuranic Package Transporter (TRUPACT)-II containers with TRUPACT-III containers to transport waste. If TRUPACT-III containers are used, analysis should be included in Appendix J. Commentors stated that crash testing should be performed on TRUPACT containers. A report by the Environmental Evaluation Group should be used in determining safe packaging for transport as well as addressing concerns from transport. Commentors requested that DOE provide a description of pipe overpacks and expressed concern regarding NNSA developing capability to load TRU waste into pipe overpacks in the Superblock. The overpacks would allow higher actinide loading in each drum, up to 80 plutonium-equivalent curies per drum, and up to 200 fissile-gram equivalents. Commentors believe DOE should not ship waste using single walled containers.

Response: *The proposed TRUPACT-III shipping package would be a Type B container as defined by DOT and the NRC. Accordingly, it will be required to meet the same stringent safety specifications as for the TRUPACT-II. Should NRC certify this package and should DOE use it, the package would only be used under conditions consistent with its certification and safety analysis report. NNSA has not evaluated its use, and prior to the certification of the package, cannot state whether any LLNL TRU waste would be shipped in a TRUPACT-III. According to the DOE press release cited in the comment, the TRUPACT-III is expected to reduce the number of trips and the dose from handling packages.*

The TRU waste transportation accident analysis in the LLNL SW/SPEIS was performed under the assumption that a TRUPACT-II would be used. Given that the TRUPACT-III is also a Type B container, it is unlikely that the analytical results would change should a TRUPACT-III container be used. Should DOE adopt the TRUPACT-III, DOE will ensure that its use remains within the safety envelop of previous analyses for the TRUPACT-II. In addition, the Final LLNL SW/SPEIS provides updated information on TRU waste shipments in Appendix J.

The latest NRC Certification of Compliance for the TRUPACT-II (#9218) permits up to 14 S100 or S200 pipe overpacks in the TRUPACT-II, each overpack contained in a 55-gallon drum. The certification was issued July 3, 2003. DOE uses TRUPACT-II containers throughout the DOE complex for shipment of TRU waste to the WIPP and would schedule TRUPACT-II containers should the shipments described in Section 3.3.15 occur. A description of the pipe overpack can be found at the WIPP website: <http://www.wipp.ws/fctshts/TRUwastecontainers.pdf>.

21 UTILITIES AND ENERGY

- 21.01** Commentor questioned why the issue of energy consumption is not considered in the LLNL SW/SPEIS. The cumulative impacts to the Livermore area and Alameda County need to be assessed.

Response: *Energy (e.g., fuel and electricity) consumption associated with each alternative is evaluated in Chapter 5, Sections 5.2.12, 5.3.12, and 5.4.12 of the LLNL SW/SPEIS. The assessment includes impacts associated with the Livermore Site and Site 300, as well as, cumulative impacts to the Livermore area and Alameda and San Joaquin counties. Mitigation measures are addressed in Chapter 5, Section 5.6.13.*

22 MATERIALS AND WASTE MANAGEMENT

- 22.01** Some commentors requested that the LLNL SW/SPEIS address the increased risk of accidental releases from the transport of nuclear materials. Commentor stated that the LLNL SW/SPEIS should discuss the WIPP in further detail: What type of facility is it and where is it located? How will the WIPP decontaminate, dispose, and transport the waste? Will waste be sent directly to WIPP or held at an interim facility? Commentor questioned why the WIPP Mobile Vendor facility and the shipping contractor are categorically excluded from NEPA review given that approximately 1,000 drums of TRU and mixed TRU will be shipped to WIPP. Commentor requested a copy of a document that discusses TRU waste at LLNL.

Commentor stated that the LLNL SW/SPEIS should provide precise estimates of the number of drums that will be shipped to WIPP over the next twenty years. The LLNL SW/SPEIS should also provide an estimate of the number of highway route control quantity shipments projected from LLNL to WIPP.

Response: *Bounding transportation accidents are presented in Section 5.5, which is supported by Appendix D and Appendix J. The presentation provides probabilities of occurrence where they are available. Doses to truck drivers are carefully controlled and limited under the controlling radiation protection program in accordance with DOT and DOE regulations. Health and safety impacts to workers are discussed in Sections 5.2.14, 5.3.14, and 5.4.14.*

Current plans are that transuranic waste drums at LLNL would be shipped directly to WIPP. WIPP is located 26 miles east of Carlsbad in southern New Mexico, and its operations are not within the scope of the LLNL SW/SPEIS. WIPP's operation and the transportation of waste to it was evaluated in the Waste Isolation Pilot Plant Final Supplemental Environmental Impact Statement (DOE 1997e) and in the Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive Waste and Hazardous Waste (DOE 1997f). Appendix J analyzes annual transportation of waste shipments to WIPP, including the number of shipments.

DOE concluded that the mobile characterization equipment used to prepare and to ship approximately 1,000 drums of TRU and mixed TRU waste to WIPP would have no individually or cumulatively significant effect on the human environment. The activity is primarily characterization with some limited repackaging under negative pressure conditions. DOE determined that this facility was categorically excluded from further NEPA review based on 10 CFR Part 1021 Appendix B to subpart D, categorical

exclusion B.6.6, which states that modification of an existing operation for packaging and repackaging waste can be categorically excluded (DOE 2003g). The shipment of approximately 700 drums of legacy TRU waste from LLNL to WIPP has been completed.

- 22.02** Commentor stated that increases in waste generation will further contaminate air, water, and soil at Livermore Site and Site 300. An analysis needs to be performed in the LLNL SW/SPEIS of the environmental impact attributed to the increased allowable amounts of radiological and hazardous waste. The LLNL SW/SPEIS should also discuss waste disposal, storage, and continuing increases of material usage rates after a 10-year period. Commentors requested that DOE disclose information concerning the quantity and potential usage of lithium hydride at Site 300. Some commentors expressed concern regarding LLNL's waste disposal plan, such as disposition pathways for nuclear wastes and D&D wastes. The commentor requested that the LLNL SW/SPEIS discuss occupational protection of workers. Production of waste should not be increased until it is assured that waste will not further pollute Site 300, harm workers, or cause an increase in risk to the public. Commentors stated that LLNL is not licensed as a hazardous waste disposal facility.

Commentors stated that the LLNL SW/SPEIS failed to consider the impacts that waste production would inevitably have at offsite disposal locations and transportation routes. Commentor questioned what procedures would be used to reduce or maintain current waste stream levels. If waste stream levels increase, what NEPA process will be used to address the environmental impacts of such increases?

Response: *As discussed in Chapter 4, Section 4.15.2.1, LLNL manages generated waste in accordance with all applicable Federal, state, and local laws and regulations to minimize potential impacts on air, water, and soil. Depending upon the alternative and the specific waste type, waste generation could increase or decrease in the future when compared to the existing baseline. The environmental, health, and safety impacts associated with waste generation and management are presented in Chapter 5 of the LLNL SW/SPEIS. The waste generation levels established for the Proposed Action are expected to reasonably bound any activities at the LLNL through the foreseeable future. All wastes expected to be generated at LLNL have established disposition paths. Waste minimization and pollution prevention is discussed in Appendix O. Appendices A and D discuss lithium hydride at Site 300. Refer to Comment Response 31.02 for information pertaining to the scope and timeframe of this document.*

- 22.03** Commentor stated that the proposed changes in administrative limits and new construction would require modification of existing facilities' permits, to allow different types of waste to be stored and treated. The LLNL SW/SPEIS should identify the modifications where known, and if not known, provide the reasoning for establishing estimates of Class 1, 2, or 3 permit modifications in Appendix B. Commentor stated that the title of the "special initial study" should be changed to "initial study." An environmental impact analysis of these chemicals should be completed based on the new permits.

Response: *Permit classifications and their numbers cited in the comment come from Table B.3–2. Appendix B, Section B.3 provides considerable detail on all the activities that would occur under the No Action, Proposed Action, and Reduced Operation alternatives. Many of the activities discussed in this section require permit applications/modifications; however, not all are discussed in terms of permit classifications. The numbers of each type are presented in Table B.3–2 as a summary in order to provide an opportunity to compare the various alternatives. Table B.3–3 provides another summary viewpoint of permit actions under the alternatives. Tables B.3.1–1, B.3.2–1, and B.3.3–1 indicate types of activities that would constitute Class 1, 2, or 3 actions under each alternative. The footnotes direct the reader to 40 CFR Part 270 for more detailed information on classification definitions. The LLNL SW/SPEIS assesses the environmental impacts of activities at LLNL, which includes the use of chemicals and the required permits. The LLNL SW/SPEIS analyzes the increased storage or processing of waste for which DOE/NNSA would have to obtain permits or permit modifications from the Department of Toxic Substances Control (DTSC). These permits would include storage of waste and the use of chemicals needed to process waste. The discussion in Appendix B describing the permitting level (Class 1, 2, or 3) is based on NNSA’s experience with the permitting process; however, the final classification is based on DTSC approval.*

Appendix B of the LLNL SW/SPEIS has been changed to reflect the change of the title from “special initial study” to “initial study.”

- 22.04** Commentors expressed opposition to the current activity of recycling and releasing radioactive material under DOE Order 5400.5.

Response: *The Secretary of Energy has halted recycling and free-release of radioactive metals, pending completion of a programmatic EIS on this subject.*

- 22.05** Commentor stated that DOE provided quantities of TRU waste in Table B.3–1 that are inconsistent with levels generated by LLNL. Regarding Table B.3–2, an explanation should be given as to why TRU waste generation is less for the Proposed Action than for the No Action Alternative.

Response: *The Final LLNL SW/SPEIS provides updated and corrected information on waste volumes in Tables B.3–1 and B.3–2. Based on the new information, the TRU waste generation for the Proposed Action is no longer less than the No Action Alternative.*

- 22.06** Commentor stated that additional information should be added regarding disposition of waste, waste composition, quantity of waste, method of transportation, discharge location and spill prevention plans, and soil and groundwater contingency plans. The LLNL SW/SPEIS needs to include information regarding discharge of waste from the EMPC and the HEDC.

Response: *The LLNL SW/SPEIS assesses disposition of waste, waste composition, quantity of waste, method of transportation and discharge locations for LLNL in*

Chapters 4 and 5, as well as Appendix B. This analysis includes waste generated from EMPC and the HEDC. EMPC and the HEDC are replacement facilities as described in Appendix A, Section A.3.4. The operation of these facilities would have impacts similar to those that they replace. Therefore, the waste from these facilities is within the Proposed Action totals. Spill prevention plans and soil and groundwater contingency plans are developed as necessary in accordance with applicable laws and regulations.

- 22.07** Commentor stated that Sections A.2.4.18, A.3.3.7, and A.3.4.3 do not discuss the storage and disposal of D&D materials. DOE needs to further discuss potential steps for storing and disposing of such contaminated materials. Commentor questioned why Section B.4.15.2 states that additional review may be required, when this should be occurring now, at the project proposal stage. Commentor stated the closure of Building 419 should be discussed in the LLNL SW/SPEIS; additionally, post closure care should be addressed if clean closure cannot be achieved.

Response: *In Appendix A, the volumes of D&D debris discussed in the cited sections are presented in Tables A.2.3–2 and A.3.3–2. This combined waste volume, and its storage and disposal, is addressed in Appendix B, Sections B.5.1.15, B.5.2.15, and B.5.3.15. Appendix B, Section B.4.15.2 acknowledges that if the waste volumes are significantly larger than expected, then additional NEPA review would be necessary. Appendix A, Table A.2.3–2 includes information concerning D&D of Building 419.*

23 HUMAN HEALTH AND SAFETY

- 23.01** Commentor expressed concern regarding the historical and future releases of radioactive materials into the surrounding community, which is densely populated. One commentor specifically stated that significant amounts of plutonium have been found at Big Trees Park near the Livermore Site. One commentor specifically asserted that the LLNL SW/SPEIS inappropriately isolates its analysis of impacts from history. The LLNL SW/SPEIS should contain analysis of historical plutonium releases at all DOE facilities, especially with the Proposed Action to manufacture prototype plutonium pits. Commentor contended that radioactive release figures are low. Radiation toxicity levels have been increasing in the Livermore area for decades. DOE should conduct a rigorous review of the plutonium facility and recommend significant design upgrades. The LLNL SW/SPEIS should provide the cumulative and long-term effects of such releases from proposed facilities. Also, the LLNL SW/SPEIS needs to provide proposed mitigation measures to minimize any adverse impacts.

Commentors indicated that most of the health impacts to the public from LLNL operations are from accidents and recommended that DOE/NNSA redo the Draft LLNL SW/SPEIS in order to produce a credible assessment of health impacts.

Commentors questioned impacts to children.

Response: *Historical impacts in terms of dose from all radioactive releases (including plutonium) for the period 1998-2002 are described in LLNL SW/SPEIS in Chapter 4,*

Section 4.10.5. As shown in this section, impacts are far less than regulatory limits and background radiation impacts. Impacts from earlier years, also far less than regulatory limits, can be found in documents such as Site Annual Environmental Reports and NESHAPs Annual Reports. The LLNL SW/SPEIS presents the long-term direct, indirect, and cumulative impacts to human health and the environment for the Proposed Action from future releases of radioactive materials in Chapter 5, Section 5.3.14. Chapter 4, Figure 4.10.5–1 shows that tritium releases have significantly decreased over the past twenty years. Chapter 4, Table 4.10.5–2 shows the dose to the MEI and the population from LLNL releases between 1998-2002.

With respect to plutonium found in Big Trees Park, plutonium was discovered at higher-than-expected concentrations in Big Trees Park in 1993 during an EPA check of background plutonium values in the vicinity of LLNL. In 1995, LLNL in collaboration with the EPA, state regulators, and the public, collected additional soil samples from Big Trees Park to verify the 1993 finding and evaluate any potential hazards to the public. After sampling, the EPA and state regulators concluded that the plutonium in soil at Big Trees Park was below the residential preliminary remediation goal (PRG; 2.5 picocuries/gram), presented no health hazard, and required no further action. This information is detailed in the Livermore Big Trees Park: 1998 Summary Results, August 13, 1999.

The LLNL SW/SPEIS evaluates the impacts to the public from normal operations as well as accidental releases. NNSA's evaluation was performed in accordance with current regulations and requirements and uses validated data and conservative assumptions to perform the analysis provided in the LLNL SW/SPEIS.

LLNL considers and implements mitigation to reduce radioactive and hazardous releases through a number of programs. The LLNL Integrated Safety Management System integrates environmental, safety and health protection to the public, workers and environment into management and work practices. The LLNL Pollution Prevention Program is designed to minimize pollutant releases to all environmental media from all aspects of the site's operations. New processes and experiments are reviewed to consider possibilities from mitigation actions such as chemical substitutions, process changes and material recycling. New projects are designed with the goal of minimizing or mitigating potential environmental impacts through project modifications at the design stage. The Site Annual Environmental Reports, Section 5.6, and Appendix C of this LLNL SW/SPEIS discuss these mitigation programs further.

For information regarding cancer rates in children, see Comment Response 25.05.

- 23.02** Commentor expressed concern regarding adverse impacts to human health and suggested that the LLNL SW/SPEIS consider and report all types of morbidity effects of the facility. DOE should look at adverse biological effects from even the smallest radioactive emission and incorporate precautionary principles. Commentors questioned what time frame and operation level was used to determine the LCFs. Are the doses

calculated at maximum dose rates for each operation at the lab? A commentor questioned if DOE underestimated cancer rate numbers.

DOE should consider the cumulative impacts (i.e., three power plants in the Tracy area) of additional cancer rates and other illnesses on a vulnerable population. The LLNL SW/SPEIS should discuss the elevated rates of malignant melanoma in the Livermore area. Commentor stated that there is a significant increase in birth defects among the offspring of LLNL employees. LLNL puts their workers at risk of cancer. Some commentors expressed concern regarding the effects of tritiated water on living cells, specifically those of the embryo or fetus. Also, tritium radiation can interfere with the human master-code mechanism for DNA and cell membrane systems. Commentors suggested that since biological and chemical hazards exist on and near the facility, an aggregate cancer study is needed. A commentor suggested the LLNL SW/SPEIS must define mitigation measures to reduce the risk of radioactive and hazardous releases to the worker and community.

Regarding Table 5.3.14.1–1 and similar tables, are the latent cancer fatalities given by year, 10 years or by the life of the project? If the life of the project, please state the assumption as to life expectancy of the project. Also, are the data in the table stated as an annual dose at maximum operations level? Are the doses calculated at maximum dose rates for each operation at the lab?

A commentor stated that the projected levels of tritium release are unacceptable. The LLNL SW/SPEIS should define the level of projected tritium release. A commentor requested that DOE consider the long-term environmental and human costs associated with this action.

Response: *Appendix C, Section C.4.2.3 identifies the risk of any health detriment from exposure to radiation, including nonfatal cancers and genetic effects, to the site-wide MEI at both Livermore Site and Site 300. Section C.3.3 describes the health risk estimators for each of these effects. Adverse effects from even the smallest radioactive emissions are included in the LLNL SW/SPEIS because of the use of these linear health risk estimators. Mitigation measures are implemented through LLNL operating procedures.*

Generally, LCFs are presented in the LLNL SW/SPEIS as the lifetime risk of a LCF to an exposed individual as a result of an annual exposure. Tabular examples of LCFs presented in this way are in Appendix C, Tables C.3.3–1 and C.4.2.3–1. The operation levels in these tables are those associated with each of the action alternatives. Worker doses are also generally expressed as annual cumulative exposures (e.g., Table 4.16.2.2–1). Worker doses include exposure at maximum dose rates experienced by site workers.

There are a number of power plant projects in various stages of review before the California Energy Commission. The Commission's facility certification process carefully examines public health and safety, environmental impacts and engineering aspects of

proposed power plants, and stringent controls are required to mitigate air pollutant emissions and associated health risks. In the Commission's findings regarding the San Joaquin Valley Energy Center (SJVEC) Project, one of the larger regional projects (total generating capacity would be 1,087 megawatts to be sited in Fresno County), the Commission found that the potential risk of cancer from SJVEC's emissions during construction and operational activities would be insignificant, and that the project will not result in any significant cumulative cancer or chronic noncancer health impacts. Two projects sited in San Joaquin County are considerably smaller, with total combined generating capacity about 25 percent of the SJVEC. The cumulative impact of these projects, together with impacts of proposed activities at Site 300 would not significantly contribute to additional cancer rates and other illnesses on a vulnerable population.

Melanoma rates were determined to be elevated for the study period 1960–1991 (California Department of Health Services 1995). However, in a review of Health Studies performed by the California Department of Health Services in cooperation with the Agency for Toxic Substances and Disease Registry, it was determined that more recently, cancer rates among Livermore residents have been found to be similar to the Bay Area as a whole. The number of melanoma cases occurring in a census tract bordering LLNL was greater than expected, but statistically within the range that could have occurred by chance.

This same study found that the overall rate of birth defects was very similar to the statewide total (2.5 per 100 live births in Livermore compared to 2.9 per 100 across the state) and that the numbers of specific birth defects were similar to or lower than statewide rates, and the number of other major birth defects was not significantly greater than expected in Livermore (California Department of Health Services 2003).

The effects of tritiated water on the embryo or fetus, and on human DNA, are considered in the LLNL SW/SPEIS (see Appendix C, Section C.4.2 for more detailed discussion). Such effects are not expected at the low exposure levels experienced at and in the vicinity of LLNL.

- 23.03** Commentors expressed concern regarding radioactive and hazardous releases to LLNL workers. Commentor stated that human damage is calculated in terms of LCFs, but other morbidity consequences are ignored. Commentor suggested that the LLNL SW/SPEIS report all types of morbidity effects of the facility under all alternatives.

Commentors questioned whether the HEPA filters on the gloveboxes in Building 332 remain in ill-fitting housings. If they have been changed, please indicate when. How old is the oldest HEPA filter currently in use?

Response: *Nonradioactive health risks, such as beryllium disease and occupational injuries are addressed in Chapter 4, Section 4.16.1 and Chapter 5, Section 5.2.14.1. Calculation of radioactive health risks in terms of LCFs is reasonable for NEPA analysis. Additional information is provided in Comment Response 25.05.*

The HEPA filters on the gloveboxes in Building 332 are not in ill-fitting housings. In accordance with DOE requirements, the LLNL HEPA filters are maintained in safe working order and replaced in accordance with LLNL procedure (UCRL-AR-133354-Rev.2).

- 23.04** Commentor stated that the LLNL SW/SPEIS should address workers' compensation, should an employee fall ill or pass away from a work-related event. Several commentors questioned whether LLNL employees (both past and present) would be compensated for adverse human health effects.

Response: *A discussion of employee benefits programs (worker or company funded), e.g., workers compensation, company supplied life insurance, supplemental life insurance, etc., in effect to cover worker illnesses or death is outside of the scope of this analysis. Although the LLNL SW/SPEIS does not discuss workers' compensation acts specifically, DOE monitors and analyzes the potential health effects of its workers.*

The Energy Employees Occupational Illness Compensation Program provides benefits authorized by the Energy Employees Occupational Illness Compensation Program Act (EEOICPA or Act). The Department of Labor's Office of Workers' Compensation Programs is responsible for adjudicating and administering claims filed by employees or former employee or certain qualified survivors of the Act. For more information regarding this program, the commentors are directed to the program web site (<http://www.dol.gov/esa/regs/compliance/owcp/eeoicp/main.htm>).

- 23.05** Commentor stated that a recent study of negative health impacts in the Livermore area criticized the Agency for Toxic Substances and Disease Registry assessment of LLNL for not using models to accurately predict radioactive doses. Because the study found the assessment to be inadequate, DOE must provide a credible assessment of health impacts on workers and the public.

Response: *The purpose of the LLNL SW/SPEIS is to conduct a credible assessment of the health impacts to the workers and the public. This is done using a broad range of available information and models developed by regulatory agencies and data drawn from experience. In the case of existing operations, the information on worker dose is based on exposure records. In the case of new operations (e.g., NIF), worker doses are based on models, which simulate worker exposure for the operations to be performed. Health impacts to the public are based on mathematical models that incorporate operation release mechanisms, transport of the releases through the environment, and human exposure pathways (see Chapter 5, Sections 5.1.8 and 5.1.14).*

24 SITE CONTAMINATION AND REMEDIATION

- 24.01** Commentor expressed concern regarding the legacy and proposed increase of hazardous waste at the Livermore Site. Increased contamination would contribute to the unaddressed and inadequate cleanup of all DOE sites. Specifically, commentors were concerned about the shipment to and the storage of legacy waste at Hanford.

Response: *Stored waste would be contained in accordance with regulatory standards and would not result in contamination of the environment. Accidental releases would be subject to rapid cleanup under existing spill response plans and would not contribute to existing contamination at LLNL. Procedures detail the safe practices that are to be used in the handling of waste to prevent exposure of workers and contamination of the environment. Legacy waste at Hanford and the cleanup of all DOE sites are beyond the scope of the LLNL SW/SPEIS. LLNL remediation activities are discussed in detail in Chapter 4, Section 4.17.*

- 24.02** Commentor expressed concern regarding the legacy and proposed increase of hazardous waste at Site 300. Commentor stated that although remediation efforts continue, the LLNL SW/SPEIS does not discuss the fact that groundwater contamination at Site 300 continues to be above drinking water standards, regardless of remediation efforts. Commentor stated that no pristine areas should be contaminated. Safe practices should be top priority and no standards, regulations, or permits should be modified to allow increased levels of contaminants. Please describe if and how increases in contaminants to air and soil may take place and risks involved. Do not execute a plan that increases air and ground pollution. Commentors expressed concern regarding a westward trending radioactive groundwater plume from the Livermore Site. Commentors stated that the EPA has designated LLNL as a Superfund site.

Response: *Chapter 4.11.3 of the LLNL SW/SPEIS provides detailed descriptions of groundwater and the hydrologic conditions at both the Livermore Site and Site 300 including information about occurrence and flow of groundwater, water quality, and the types and concentrations of groundwater contamination. Chapter 4.11.3.4 discusses the potential mobility of tritiated groundwater and also indicates that natural decay has resulted in concentrations below drinking water standards. The LLNL SW/SPEIS also presents a detailed description of groundwater contamination, concentration trends, and status of remediation activities that are being conducted in accordance with CERCLA at both the Livermore Site and Site 300 in Chapter 4, Section 4.17. As discussed in Appendix C, LLNL implements programs to provide safe working conditions for employees and to limit exposures of the general public to hazardous and radioactive materials. These programs are conducted in accordance with regulatory requirements and include implementation of administrative and engineered controls to minimize potential releases as well as surveillance monitoring of the environment and reporting of exposure assessments. With respect to potential releases of hazardous and radioactive materials from ongoing operations, please see Comment Response 24.01. DOE acknowledges that LLNL has been designated as a Superfund site and is implementing remediation as required by state and Federal regulations.*

- 24.03** Commentor stated that the LLNL SW/SPEIS needs to discuss CERCLA issues and remediation in greater detail. Existing contamination should be cleaned up before expanding program activities. Potential “trade offs” that may lead to cleanup budget shortfalls must be discussed in the LLNL SW/SPEIS.

Response: Detailed information on CERCLA issues and remediation is found in the Site Annual Environmental Reports for LLNL. Section 4.17 of the LLNL SW/SPEIS summarizes information from the most recent of these reports. Program activities are not anticipated to have any effect on the rate of cleanup of contaminated areas. The installation and operation of remediation systems are largely governed by agreements with regulatory entities. Cost and budget concerns will be addressed in the ROD as appropriate.

- 24.04** Commentors expressed concern regarding LLNL's environmental monitoring program. Commentors expressed concern about recent offsite sampling by The RadioActivist Campaign (TRAC) that found elevated levels of four radionuclides just outside the Livermore Site boundary.

Response: LLNL's environmental monitoring is done in accordance with Federal, state, and local requirements. The levels of the four radionuclides are well within fallout background that is well understood by the LLNL. LLNL's environmental monitoring program collects thousands of samples annually to determine compliance with regulatory standards. According to information obtained from TRAC, 12 samples were collected by the organization in December 2003 and analyzed for various radionuclides. Samples were collected from a variety of media including grass, sediment, leaves, and surface water from Arroyo Seco. However, all results were compared to Federal drinking water standards for community water systems (40 CFR Part 141) that are calculated to be protective of human health based on repeated human exposure to contaminants through intake of water. Radionuclide activity exceeded the standard for only one radionuclide in one sample, strontium-90, in a grass sample collected approximately three miles west-northwest of the Livermore Site. The result reported in the analysis of this sample is 190 ± 160 picocuries wet, which TRAC admits is "a low level of confidence" and "invites follow-up sampling." Note that strontium-90 can be present in soils throughout the United States as a result of fallout from aboveground testing of nuclear weapons from 1945 to 1980. TRAC conducted a second sampling in May 2004, collecting a similar number of samples, and obtained one data point above their detection limit, which was also consistent with weapons test fallout.

- 24.05** Commentor wants DOE to explain its assertion in Section 5.3.15.3 that there is no significant difference in potential for contamination between the Proposed Action and No Action alternatives. Also, the LLNL SW/SPEIS does not take into account adverse effects onsite, should contamination arise from D&D activities.

Response: Program activities are not anticipated to have any effect on the rate of cleanup of contaminated areas. The installation and operation of remediation systems are largely governed by agreements with regulatory entities. The potential for accidental releases would increase because of greater site activity under the Proposed Action, but these releases would be subject to rapid cleanup under existing spill prevention, control, and countermeasures (SPCC) plans and would not be expected to contribute to existing contamination at LLNL. Any accidental contamination resulting from D&D activities

would also be subject to rapid cleanup under existing SPCC plans; no adverse effects would be expected.

25 ACCIDENTS

25.01 Commentor questioned the adequacy of the accident analysis. By increasing plutonium limits, the risk of LCFs during an accident would increase to 288 percent of the present risk to plant workers and general public in close proximity. Even the lesser amount of plutonium used in the No Action Alternative would reach criticality with horrific consequences. Commentor expressed concern regarding the risk earthquakes pose to LLNL buildings containing bio-agents, plutonium, tritium, and other radioactive materials. Potential release of such contaminants could endanger the area for generations.

Commentor stated that the bounding accident scenario for Building 332 is the unfiltered fire in one room, with a MAR of 60 kilograms of plutonium. However, the administrative levels allow 60 kilograms in each of the two rooms. The detailed analysis of a plane crash does not provide MAR, but should contain 120 kilograms of plutonium, with a disturbance in two rooms. If this is correct, would the plane crash become the bounding scenario?

Commentor requested that DOE conduct an analysis of a hydrogen deflagration accident. It has nearly five times the source term as the unfiltered fire, and greater estimated probability. This would point to it as being the bounding accident for Building 332.

Commentor stated that emergency diesel generators (EDGs) in the 1990s failed routine tests numerous times. Accident scenarios should not presume that EDGs will be working, both to run the ventilation system and other emergency equipment. A credible scenario of an unfiltered fire with no power should be analyzed.

Commentor stated that during a fire, HEPA filters and seals are prone to failure because the filter is made of paper and would lose its filtering capability when wet (from fire suppression) and would be severely damaged by high temperatures.

Commentor stated that risk of a fire in Building 334 involving highly enriched uranium should be analyzed in detail.

Commentor requested a more detailed assessment of drum arrays in Building 625, specifically concerning the maximum curie limits for drums.

Response: *As stated in Appendix D, Section D.1.1, the accident scenarios have been developed to reflect the broad range of accidents that might occur at LLNL. The scenarios are specific to particular buildings and operations. The wide range of postulated accidents characterizes the range of accident impacts associated with the operation of LLNL. Bounding scenarios were developed for specific hazards such as radioactive material, toxic chemicals or high explosives for an operation in a building.*

An accident analysis of biological hazards is presented in Appendix D, Section D.5. The LLNL SW/SPEIS accident analysis was conducted in accordance with applicable guidance, requirements and regulations as appropriate.

With the removal of ITP from the Proposed Action, the MAR is now 40 kilograms of plutonium (compared to 60 kilograms in the Draft LLNL SW/SPEIS). The Proposed Action bounding accident scenario for Building 332 remains the unfiltered fire in one room with lesser consequences as described in Section D.2.4.9.2 of the LLNL SW/SPEIS. A simultaneous fire in two rooms, each having a MAR of 40 kilograms of plutonium, has a frequency of occurrence conservatively estimated to be much less than 1×10^{-6} and therefore is considered not reasonably foreseeable.

The possibility of an inadvertent criticality in Building 332 was assessed in the LLNL SW/SPEIS. As noted in Section D.2.5 of the LLNL SW/SPEIS, the bounding case radiological accident for involved workers is a plutonium criticality for a powder, slurry, or solution system in a workstation in Building 332. Severe worker exposures could occur inside the facility as a result of a criticality, due primarily to the effects of prompt radiation. A criticality would be detected by the criticality alarm system, and an evacuation alarm would sound. All personnel would immediately evacuate the building. The accident would have minimal offsite consequences when compared to other accidents analyzed.

The potential offsite impacts of a large earthquake are described in Section D.6.2 of the LLNL SW/SPEIS. As described in Section D.6.2, taking the conservative approach of summing the doses for each of the individual facilities results in a total radiation dose at the site boundary under median meteorological conditions of 1.03 rem. Using the dose-to-risk conversion factor of 6×10^{-4} per person-rem, the MEI has a probability of 6.02×10^{-4} (or one chance in 1,620) of the development of a fatal cancer. The collective radiation dose to the approximately 6,900,000 people living within 50 miles of LLNL under the multiple-building release scenario for median meteorology was calculated to be 417 person-rem. The collective population dose is estimated to result in an additional 0.24 LCF to this population.

Under unfavorable meteorological conditions, the radiation dose to the MEI for the multiple building release scenario is 20.4 rem. Using the dose-to-risk conversion factor of 6×10^{-4} per person-rem, the MEI has a probability of 0.011 (or 1 chance in 95) of the development of a fatal cancer. The collective radiation dose to the approximately 6,900,000 people living within 50 miles of LLNL under the multiple-building release scenario for unfavorable meteorological conditions was calculated to be 4,320 person-rem. The collective population dose is estimated to result in 1.76 LCFs to this population.

As described in Section D.2.3 of the LLNL SW/SPEIS, the aircraft crash probability for LLNL facilities is dominated by general aviation, which represents approximately 99 percent of the total probability reflected in Table D.2.3–1 of the LLNL SW/SPEIS. General aviation operations at the Livermore Municipal Airport represent approximately 93 percent of the total probability reflected in Table D.2.3–1. Over 95 percent of the

Livermore Municipal Airport operations are represented by the general aviation subcategories of single engine piston, multi-engine aircraft, and helicopter aircraft. A similar distribution of airframes was assumed for the general aviation data for Tracy Municipal, Byron, and in-flight operations. Therefore, the consequences of a large single-engine piston aircraft impacting facilities at the Livermore Site bound the reasonably foreseeable accidents into LLNL facilities. This single-engine piston aircraft is not of sufficient size to impact more than one room of Building 332 simultaneously. Therefore, the amount of material contained in a single room of Building 332 is the appropriate MAR for this accident scenario.

In the LLNL SW/SPEIS, NNSA evaluated two hydrogen deflagration scenarios: filtered and unfiltered. As shown in, Table D.2.4–1, for the filtered scenario, the source term is 9.0×10^{-3} grams fuel-grade plutonium for the No Action Alternative and 0.027 gram fuel-grade plutonium for the Proposed Action. For the unfiltered scenario, the frequency is much lower than the level considered “beyond reasonably foreseeable” and thus not appropriate for analysis in an EIS.

The facility accident scenarios presented in the LLNL SW/SPEIS do include scenarios where the room exhaust system is unavailable because of an independent, random loss of offsite and emergency power to the building. For example, in Building 332, the unavailability of the room exhaust system for a 10-hour duration is estimated as being 1.1×10^{-4} . It should be noted that, contrary to the commentor’s assertion, the bounding accident for Building 332 for the Proposed Action is an Evaluation Basis Room Fire (unfiltered release), where the ventilation system is assumed to be inoperable (see Section D.2.4.9.2). The failure of the HEPA filters was not included in the Evaluation Basis Room Fire scenario because their failure during a fire would make the scenario a not reasonably foreseeable event. Should any burning materials get into the ventilation system before the dampers operate, the HEPA filters are protected by deluge sprays and demisters to cool and de-water the air reaching them.

As shown in Table D.2.4–1, an unmitigated fire in Building 334 involving highly-enriched uranium was evaluated in the LLNL SW/SPEIS. This accident scenario resulted in a release to the environment of 100 grams of highly-enriched uranium. NNSA performed consequence assessment calculation for this release (as well as for the other accident scenarios shown in Table D.2.4–1), and the calculated consequences of this scenario were well below those of the Uncontrolled Oxidation of Plutonium at Elevated Temperatures scenario for Building 334. Therefore, this latter scenario is the bounding radiological accident for this building and is further described in Appendix D, Section D.2.4.10.

As noted in Section D.2.4.11 of the LLNL SW/SPEIS, NNSA conducted a detailed assessment of the risks of storage of transuranic waste drums of in Building 625. It is anticipated that drums containing up to 60 plutonium-equivalent curies would be stored in Building 625. In this accident analysis, the maximum curie limit under the Proposed Action is assumed to be equivalent to an array of drums where one drum contains 60 plutonium-equivalent curies and the other surrounding drums contain 12 plutonium-

equivalent curies. The shipments of legacy TRU waste, including Building 625, from LLNL to WIPP have been completed. It is projected that future waste shipments to WIPP will be completed before Building 625 and other LLNL transuranic waste storage facilities are fully loaded. Therefore, the consequences discussed above are associated with what would be considered a maximum peak inventory in Building 625 that would be allowed under the facility's operational procedures, but may never occur. This analysis of this accident included sufficient detail to identify impacts to the involved worker, noninvolved worker, maximally exposed individual, and offsite population.

- 25.02** Commentor expressed concern regarding potential for chlorine gas release. This could disable security forces and personnel, so that an accident could occur. Explain how operations could be safely shutdown if there was a hazardous leak. In addition, DOE should analyze an accident involving these substances.

Commentor stated that it is not clear whether the actions in Table B.3–3 were considered during the selection process for accident scenarios. In particular, was the storage of hazardous and mixed waste in Building 696R considered in the evaluation of chemical accident scenarios? Table 5.5.2.2–1 and Table D.3.2–1 do not include Building 696R.

Commentor questioned why Section D.3.2.10 states that an accident scenario involving an earthquake release of Freon-22 scenario assumes that drums will not be stacked two high, when the Hazardous Waste Permit for the Livermore Site would allow stacking of 55-gallon drums.

Response: *As discussed in Section D.3.2.8 of the LLNL SW/SPEIS, NNSA assessed a postulated release of chlorine from Building 332. A potential cause of such an event could be the failure of various system components. The potential release paths include pipe ruptures in four different piping sections or leaks from the chlorine cylinder and the two valves in the system. These contributors to the release potential were considered. It was assumed that any leak inside the gas cabinet would be detected and mitigated in time. Unless the gas cylinder valve fails catastrophically, the safety features associated with the toxic-gas installation would allow only a very small release of toxic gas under any abnormal conditions. A more severe release could result if these features, or combinations of these features, failed to function.*

A source term was developed for the unmitigated release from the apparatus. An unmitigated release of chlorine or hydrogen chloride through a small orifice, 0.18 inch in diameter (corresponding to the internal diameter of the piping used [0.25-inch outer-diameter]) or a small hole in the cylinder, was examined. The source terms for the bounding scenario were developed by assuming that the chlorine gas was released through 0.25-inch outer-diameter tubing directly into the atmosphere. No credit was taken for the flow-restricting device, whose size is much smaller than 0.25 inch. The frequency of this event is 5.7×10^{-7} per year.

The gas cabinet is monitored for both chlorine and hydrogen chloride. The delivery line inside the gas cabinet has an excess flow shutoff valve and an emergency shutoff valve

located near the cylinder head. In the case of a chlorine leak, these features would serve to mitigate the consequences of such an event. It is assumed that any leak occurring inside the gas cabinet could be detected by the chlorine sensor, thereby alerting Control Room personnel, who could provide mitigation of the leak. In addition, emergency procedures in place at LLNL include immediate actions (e.g., terminate the release, limit access by personnel the area downwind of the release, and take shelter) to warn building personnel of the hazard and to prevent workers from exposure to the gas. In addition the Emergency Management Division maintains procedures that provide for notification of the facility managers of all facilities located within 100 meters of Building 332 of any potential release.

No stand-alone chemical inventories would be stored, staged, or handled in Building 696R. Small quantities of hazardous materials (California combined wastes) below reportable quantities (in total) may be found in containers with transuranic waste. Liquid waste would not be stored in Building 696R. Therefore, the potential chemical hazards for this facility would be very low and well bounded by the other facilities listed in Appendix D, Table D.3.2–1.

The first paragraph of Appendix D, Section D.3.2.10 describes how process reagents are stored in this facility, including sulfuric acid, hydrogen peroxide, ferric sulfate, and sodium hydroxide. The assumption that drums of these reagents would not be stacked two-high has been removed, but the results of the accident analysis have not changed, based on the assumption that the buildings can withstand the design-basis earthquake.

- 25.03** Commentor requested that a description of the range of possible impacts should high explosives detonate accidentally. Commentor also questioned why the LLNL SW/SPEIS did not consider accident scenarios initiated by fire at Site 300 facilities.

Response: Appendix D, Section D.4 assesses accident scenarios and impacts associated with high explosives. Many accidental detonation scenarios are addressed.

As described in Section D.2.4 of the LLNL SW/SPEIS, NNSA did consider accident scenarios initiated by fire at Site 300 facilities. In fact, as shown in Table D.2.4–1, the bounding radiological accident scenario for the Site 300 Materials Management Facilities is a “Depleted uranium release by fire.” The consequences of this accident scenario are presented in Appendix D, Section D.2.5.

NNSA also assessed the impacts of the postulated release of chemical substances caused by a fire for the Site 300 Materials Management Facilities and the Site 300 Explosive Waste Treatment Facility. The consequences of these chemical accident scenarios are presented in Appendix D, Section D.3.3.

- 25.04** Commentor questioned if the increase in plutonium MAR would have any additional concern with regards to the BSL-3 Facility. Commentor stated that different accident scenarios (e.g., plane crash, accidental needle stick, shoulder fired rocket, earthquakes, vulnerability of HEPA filters) involving the BSL-3 Facility should be evaluated to assess

the risk from release of biological agents, such as anthrax or plague. Commentor stated that due to increased work with biological material in the Proposed Action, there would be a greater effect than the other alternatives and suggested correcting.

Commentor stated that the BSL-3 Facility accident scenario in the LLNL SW/SPEIS is inadequate. The analysis relied on outdated models that were done on a different facility and not even within the DOE. DOE should conduct a programmatic environmental assessment for the expanding biological safety programs at LLNL.

Response: *The increase in the plutonium MAR in Building 332 would have no impact on operations at the proposed BSL-3 Facility. If an accident were to occur in Building 332, emergency procedures in place at LLNL include immediate actions (e.g., terminate the release, limit access by personnel the area downwind of the release, and take shelter) to warn building personnel of the hazard and to prevent workers from exposure. As a defense-in-depth, the building emergency procedures provide for notification of the facility managers of all facilities located within 100 meters of Building 332 of any potential release.*

For purposes of the LLNL SW/SPEIS, NNSA has selected a representative facility accident that has been previously analyzed by the U.S. Army in the Final Programmatic Environmental Impact Statement Biological Defense Research Program (Army 1989). NNSA believes that this accident scenario is comparable to and bounds any potential scenarios associated with the BSL-3 Facility. The BSL-3 Facility is more than 100 meters from Building 332.

An EA provides NEPA coverage for the construction and operation of this facility. The EA covered environmental impacts including groundwater. Any comments received in 2002 were addressed in the BSL-3 EA. A FONSI (DOE/EA-1442), dated December 16, 2002, was issued for the BSL-3 Facility at LLNL. Additional information concerning the operation of the BSL-3 Facility at LLNL is included in Comment Response 35.01.

- 25.05** Commentor urged DOE to formulate a safer plan for an accident at LLNL (specifically involving plutonium or tritium) that could disastrously affect the highly populated Bay Area. If an accident were to occur, how would the area be evacuated? The Hazard Prediction and Assessment Capability (HPAC) model illustrates how widely plutonium could be dispersed and the impacts to nearby residential population centers when plutonium is in proximity to an explosion. The HPAC calculations imply a much larger impact than the accident scenarios discussed in the LLNL SW/SPEIS. The LLNL SW/SPEIS should be rewritten to include HPAC calculations.

Commentor stated that the LLNL SW/SPEIS fails to acknowledge the tremendous uncertainties associated with any of the exposure risks estimated to occur from routine activities or non-routine accidents, especially if such materials enter densely populated communities.

Commentor stated that the production of large amounts of plutonium and its processing and evaporation may entail significant risks that must be evaluated in the context of urban/suburban location of LLNL. A commentor expressed concern regarding future accidental releases into the air, regardless of amount. Another commentor questioned how DOE could propose programs that involve known carcinogens and no disposal pathway; and have a half-life of 24,000 years, in an urban area such as Livermore.

Commentor stated that in addition to latent cancer fatalities, other severe effects would also result, including non-lethal cancers and diseases. The accident analysis does not evaluate the residual risks of disease from an accident. Commentor expressed concern regarding asthma in children and elderly due to air pollution. What are the current rates of asthma in children in Livermore? Are there more cases of asthma in children detected closer LLNL? Do Livermore children have more problems/diseases than children in communities without laboratories?

Response: *Plutonium is not produced in Building 332. Processing plutonium using "evaporation" will not occur since AMP and ITP have been canceled. Consequences of accidental radiological releases were determined using the MELCOR Accident Consequence Code System, Version 2 (MACCS2) computer code (Chanin and Young 1997). MACCS2 is a DOE/NRC sponsored computer code that has been widely used in support of probabilistic risk assessments for the nuclear power industry and in support of safety and NEPA documentation for facilities throughout the DOE complex. NNSA believes that the use of this code, as described in Appendix D of the LLNL SW/SPEIS provides an accurate and defensible estimate of the transport of plutonium and other radioactive materials released during the postulated accident scenarios. As described in Appendix D, Section D.2.1 of the LLNL SW/SPEIS, it was conservatively assumed that there would be no evacuation or protection of the surrounding population following an accidental release of radionuclides. While other codes, such as the Hazard Prediction and Assessment Capability (HPAC) model, could have been used to perform the accident analysis, DOE/NNSA decided to use the MACCS2 code because it was specifically designed for calculating radiological atmospheric dispersion and consequences. The HPAC code was developed to assess nuclear, biological, chemical, radiological and high explosive collateral effects.*

Health effects other than LCFs could result from environmental and occupational exposures to radiation. These include nonfatal cancers among the exposed population and genetic effects in subsequent generations. Previous studies have concluded that these effects are less probable than fatal cancers as consequences of radiation exposure. Dose-to-risk conversion factors for nonfatal cancers and hereditary genetic effects (0.0001 per person-rem and 0.00013 per person-rem, respectively) are substantially lower than those for fatal cancers. This LLNL SW/SPEIS presents estimated effects of radiation only in terms of LCFs because that is the major potential health effect from exposure to radiation. Estimates of nonfatal cancers and hereditary genetic effects can be estimated by multiplying the radiation dose by the appropriate dose-to-risk conversion factors for these effects.

NNSA is not aware of any studies demonstrating a link between radiation exposure and asthma. Therefore, incidences of asthma in the offsite population near LLNL are not an appropriate measure of the impacts of postulated LLNL facility accidents. As stated in Chapter 1, Section 1.6.4, an investigation of cancer incidence among LLNL employees did not identify any link between employment at LLNL and increased risk of cancer (Moore et al. 1997). Another study found that cancer rates among children and young adults in the city of Livermore do not differ appreciably from elsewhere in Alameda County (California Department of Health Services 1995). Another study found that birth defect rates in Livermore are similar to the overall rates for the State of California (California Department of Health Services 1996).

- 25.06** Several commentors stated that the analysis seriously underestimated the consequences of a major accident. The LLNL SW/SPEIS should address more common types of accidents and potential damage caused by each. Commentor recommended that project duration be identified and factored into the project analysis. Commentor questioned why there is no consideration of a purposeful attack. Another commentor questioned why the seismic appendix was withheld from the Summary. Regarding earthquake scenarios, the g-force number in the LLNL SW/SPEIS may underestimate the destruction that may occur at LLNL. Commentor stated that the LLNL SW/SPEIS fails discuss environmental effects in its accident analysis.

Commentor requested additional studies to extent of risks to the offsite population from failure of safety equipment and materials. Commentor stated that raw data on the accidents related to failure frequencies of equipment, and how they have been grouped, and how the specific industrial experience from comparable facilities at the Rocky Flats Plant should be incorporated. An analysis of the “changes in equipment and procedure” need to be outlined in the LLNL SW/SPEIS to evaluate accident frequencies, source terms, and radiation doses. Commentor asked for additional information explaining the derivation of accident frequencies.

Commentor questioned why socioeconomic impacts accident costs (e.g., rebuilding, remediation, property value, lost agricultural capability) were not evaluated in the LLNL SW/SPEIS.

Commentor questioned DOE’s assurance of safety given the history of LLNL’s spills, releases, and leaks. Commentor stated that the LLNL SW/SPEIS does not reflect the historical safety violations or develop mitigation measures to prevent them. Commentors questioned why human error was not factored into release calculations.

The LLNL SW/SPEIS should include inadvertent events data for the past 5 years at the Livermore Site and Site 300.

Commentor asked which prominent scientists on the LLNL staff approved the risk assessments, and if any dissented.

Commentors stated that the LLNL SW/SPEIS did not consider a bounding accident for storage vaults that would pose a measurable risk to workers outside the immediate buildings or to the neighboring community. The LLNL SW/SPEIS must evaluate probabilistic risk assessment for the No Action Alternative. A commentor stated that the LLNL SW/SPEIS should identify the weaknesses that are inherent in risk calculation. Commentor stated that only LCFs are reported in the accident analysis and questioned why other kinds of illnesses that occur from a radiation accident were not included. An accident scenario should include the failure of Building 332 emergency diesel generators. A commentor stated that the consequence of potential radiological and hazardous materials indexed in explosive accidents in Building 327 is not in the LLNL SW/SPEIS.

Commentor asked that the differences between data in the LLNL SW/SPEIS and reference LLNL 2003bg be reconciled.

Commentor requested additional information on the accident analysis for Building 696R. Commentor was concerned about accident frequencies, the possibility of an airplane crash resulting in a criticality, and other less significant accidents.

Commentor requested more detail concerning the assumptions for an array of drums in Building 625.

One commentor asserted that the accident analysis is incomplete because it does not assess the public risk perception and stigma associated with hazardous and radioactive material.

Response: *The values used in the LLNL SW/SPEIS accident analysis are based on careful consideration of the material present in the facility, potential initiating events and their probabilities, and potential pathways that material could escape through to reach the environment. These accident scenarios include a wide range of assumptions, including scenarios where human factors (i.e., employee error) initiate or exacerbate the accident. The accident frequencies listed in Appendix D were developed using generally accepted methodologies identified in DOE guidance documents. Facility accidents were identified and analyzed and bounding accidents for the site were developed. No site bounding accident for storage vaults was identified. Chapter 10 of the LLNL SW/SPEIS identifies the preparers of the document and lists their credentials.*

NNSA focused the accident analysis in the LLNL SW/SPEIS on human health impacts among LLNL workers and the general public near LLNL. Other environmental impacts could also result from the postulated facility accidents, such as loss of farm production, contamination, land usage, and ecological harm. However, these secondary impacts were determined not to be a major discriminator between alternatives, therefore they were not assessed in detail.

The consequence of potential radiological and explosive accidents in Building 327 is bounded by the accident analysis in Appendix D.

Decontamination and Waste Treatment Facility (DWTF) includes Buildings 693, 693 Annex, 695, 696, and 696R. The preliminary Safety Analysis Report (SAR) for DWTF was not used in the accident analysis. Though the preliminary SAR for DWTF assumes tritium in a single container is 3,000 curies, LLNL currently limits the amount of tritium in a single waste container to 2,000 curies for all waste storage facilities. References LLNL 2002bm and LLNL 2003y were used for analysis of waste management facilities. The operation (including equipment failures) at Building 695 is bounded by the consequences from other facilities and is therefore not analyzed in detail in Appendix D, Section D.2.4.13. The probability of an aircraft accident into facilities analyzed in Appendix D was developed using DOE Standard 3014 “Accident Analysis for Aircraft Crash into Hazardous Facilities.” It is not reasonably foreseeable that an aircraft accident into Building 696R would result in a criticality accident and therefore was not analyzed.

The accident analysis in Appendix D was completed by an independent contractor not scientist at LLNL. Data used for the analysis was collected primarily from existing LLNL documents; however, data from other sources was also used. Specifically, reference LLNL 2003bg was used as a basis for the probability (30 percent) that a fire would occur after an aircraft accident. Accident analysis in existing LLNL documents has been completed using various conservative methodologies. A standard methodology for accidents was used for the LLNL SW/SPEIS as described in Appendix D; therefore, the results in the LLNL SW/SPEIS might differ from documents such as reference LLNL 2003bg.

The future revisions to the SAR for Building 696R may include increases of container limits for up to 12 curies per container.

It is not possible to predict whether intentional attacks would occur at LLNL or at other critical facilities, or the nature of the types of attacks that might be made. Nevertheless, NNSA reevaluated scenarios involving malevolent, terrorist, or intentionally destructive acts at LLNL in an effort to assess potential vulnerabilities and identify improvements to security procedures and response measures in the aftermath of the attacks of September 11, 2001. Security at NNSA and DOE facilities is a critical priority for the Department, and it continues to identify and implement measures designed to defend against and deter attacks at its facilities. In March 2004, DOE's Office of Safeguards and Security Evaluations completed a special department-wide review at LLNL that included performance testing LLNL's Protective Force. LLNL was given a rating of “Effective Performance,” which is the highest one possible.

Substantive details of terrorist attack scenarios and security countermeasures are not releasable to the public, since disclosure of this information may be exploited by terrorists to plan attacks.

For related information see Comment Responses 25.01 and 25.05.

Table 7.4–1 has been expanded to include inadvertent event data for the past 5 years at the Livermore Site and Site 300.

The array of drums analyzed in the bounding accident for Building 625 is very conservative and assumes that the facility is loaded to its physical limits with containers of TRU waste as described in Chapter 3, Section 3.3.14. Appendix B contains a projection of TRU waste for all three alternatives.

Estimates for the amount of TRU waste were made in either drums or cubic meters in an effort to gather data to be analyzed. The results of the analysis, which includes waste from Building 332 and other facilities is reflected in cubic meters. See Appendix B for more information concerning waste management.

There is no cancer risk associated with the transport of biological material. See Comment Response 35.01 for more information concerning the shipment of biological samples to LLNL.

Perception-based impacts do not depend on actual physical environmental impacts resulting directly from the proposed project, but rather upon the subjective perceptions of individuals at any given time. Such subjective, psychological factors are not readily translatable into quantifiable impacts. People do not act consistently in accordance with negative perceptions. Also, perceptions may change over time, and perceptions may be affected by a host of other factors that may have nothing to do with the proposed project. Accordingly, any connection between public perception of a risk or stigma associated with hazardous and radioactive material would be uncertain or speculative at best, and therefore would not inform decision making.

- 25.07** Commentor noted that in the past, the Defense Nuclear Facilities Safety Board (DNFSB) has criticized LLNL operations, and most recently, strongly criticized LLNL's accident analysis. Commentor stated that the LLNL SW/SPEIS should incorporate and address concerns in the DNFSB letters concerning Building 332. The LLNL SW/SPEIS should evaluate if potential modifications of LLNL's facility operations are warranted based on the DNFSB's recent findings and recommendations. Accident scenarios must take into account potential emissions, radiation levels, and dose levels. DOE should recalculate the accident scenarios and consequences used in the LLNL SW/SPEIS. The LLNL SW/SPEIS should describe LLNL's reliance on air monitors, emergency generators, and negative airflow. In this context, DOE should include information concerning the October 2003 plutonium accident that resulted in potential employee exposure because numerous safety features failed simultaneously.

Commentor stated for the bounding accident for Building 332, certain assumptions such as the airborne release fraction (0.0005) and leak path factor (0.05) are determined. A more conservative approach would be to assume a leak path factor between 0.5 and 1, which would double the release. DNFSB criticized this leak path factor calculation, stating it was unrealistic and probably underestimates the extent of a release from unfiltered radioactive material from this facility. Commentor also questioned the

derivation of the airborne release fraction. Commentor stated that the emission release values need to be modified during an event when workers have to leave through an emergency exit.

Response: *In October 2003, LLNL submitted a proposed safety basis for Building 332, the Plutonium Facility, to the NNSA Livermore Site Office for approval. The DNFSB has raised issues concerning this proposal. However, the LLNL SW/SPEIS uses the June 26, 2002 safety basis document (LLNL 2002af) approved by the Livermore Site Office and with which the DNFSB is familiar.*

In the No Action Alternative, Proposed Action, and Reduced Operation Alternative bounding scenarios were developed and analyzed. The values used in the LLNL SW/SPEIS accident analysis are based on careful consideration of the material present in the facility, potential initiating events and their probabilities, and potential pathways that material could escape through to reach the environment.

- 25.08** Commentor stated that the airplane crash scenario assumes only a small single aircraft would be involved in an accident. The scenario needs to be recalculated to incorporate potential risk involving commercial airliner crashes, assuming a large plane crash may dominate bounding accident scenarios. For accident scenarios, the LLNL SW/SPEIS needs to discuss: 1) derivation of accident frequencies, 2) frequency of airplane crashes, and 3) unfavorable meteorological conditions. A commentor suggested that the analysis scenario be redone to include all major airports over 22 miles away in the Bay Area.

Commentator stated that the aircraft accident is inadequate. The contention that an aircraft crash into a pit manufacturing facility under the proposed accident would result in nothing more than 0.168 LCFs per year is ludicrous.

Commentor questioned what the consequences would be to the offsite populations from a terrorist attack (such as a plane crash), what evacuation procedures would be followed, where people would be displaced, and what the government would pay for offsite actions. Commentor requested information on airborne and waterborne radiological risks. A commentor stated that the full risk of a terrorist attack involving a large airplane has not been adequately considered.

Response: *As discussed in Appendix D, Section D.2.3 of the LLNL SW/SPEIS, NNSA evaluated potential aircraft crash scenarios for LLNL facilities for all types of aircraft, including commercial aircraft. The methodology in DOE Standard 3014 “Accident Analysis for Aircraft Crash into Hazardous Facilities” was used for this evaluation. As shown in Table D.2.3–3, the calculated frequency of a commercial aircraft crashing into an LLNL facility is 1×10^{-8} per year or smaller. This frequency is much lower than the level considered “beyond reasonably foreseeable” and thus is not evaluated in detail in the LLNL SW/SPEIS.*

It is not possible to predict whether intentional attacks would occur at LLNL or at other critical facilities, or the nature of the types of attacks that might be made. Nevertheless,

NNSA reevaluated scenarios involving malevolent, terrorist, or intentionally destructive acts at LLNL in an effort to assess potential vulnerabilities and identify improvements to security procedures and response measures in the aftermath of the attacks of September 11, 2001. Security at NNSA and DOE facilities is a critical priority for the Department, and it continues to identify and implement measures designed to defend against and deter attacks at its facilities. In March 2004, DOE's Office of Safeguards and Security Evaluations completed a special department-wide review at LLNL that included performance testing LLNL's Protective Force. LLNL was given a rating of "Effective Performance," which is the highest one possible.

Substantive details of terrorist attack scenarios and security countermeasures are not releasable to the public, since disclosure of this information may be exploited by terrorists to plan attacks.

- 25.09** Commentor stated that the bounding accident scenarios described in the LLNL SW/SPEIS do not address the adverse effects of an accident involving D&D activities. The potential for an accident is apparent in the large scope of D&D (820,000 square feet). Additionally, there is no discussion of offsite transportation accident scenarios involving D&D waste.

Response: *This LLNL SW/SPEIS includes and assesses D&D actions as appropriate for each alternative. For example, as described in Chapter 3, Sections 3.2.10 and 3.3.19, D&D actions are included in the No Action and the Proposed Action alternatives, respectively. The Chapter 5 impact sections include impacts related to D&D. With respect to accidents specifically, the impacts from accidents involving D&D are bounded by other accidents. The primary hazard during D&D activities is occupational injuries to the employees performing the D&D operations. These impacts are addressed in the Human Health and Safety sections of Chapter 5 (5.2.14, 5.3.14, and 5.4.14).*

With respect to transportation accidents, Appendix J, Section J.4 of the LLNL SW/SPEIS presents NNSA's analysis of potential accidents associated with transportation of the following four radiological shipment types: special nuclear material, transuranic waste, low-level waste, and tritium. The D&D waste volumes are included in this transportation analysis. NNSA examined the shipment campaigns under the No Action Alternative, Proposed Action, and Reduced Operation Alternative to identify bounding transportation accidents for each of these material types. NNSA calculated collective radiation dose to the public and LCFs from potential transportation accidents. The impacts of the accidents reported in Appendix J, Section J.4 are based on the assumption that the accidents would occur in the most populated regions along the route. Accidents in less populated regions or of lower collision impact could occur, resulting in smaller impacts. The accident probabilities were multiplied by the number of shipments.

- 25.10** Commentor expressed concern regarding cancer risk of nuclear or biological materials along transportation routes, including material from D&D activities. A traffic accident involving the transport of any of these materials would pose great danger to the entire Bay Area.

Response: *Bounding transportation accidents are presented in Chapter 5, Section 5.5, which is supported by Appendix J. For purposes of analysis, NNSA used the computer code TRAGIS to identify routes and route demographics for shipments of radioactive materials and wastes. The code determines routes based on criteria supplied by NNSA and takes into account special provisions for highway route-controlled quantities. Consequently, the analyses take into account the population density of the Bay Area. See Comment Response 20.01 for additional information.*

There is no cancer risk associated with the transport of biological material. See Comment Response 35.01 for more information concerning the shipment of biological samples to LLNL.

26 NATIONAL IGNITION FACILITY

26.01 Many commentors expressed concern and opposition regarding the proposed use of plutonium, highly enriched uranium, and lithium hydride in experiments in the NIF. Concerns centered on the potential for increasing the usefulness of the NIF for nuclear weapons development, including the design of new nuclear weapons. There were also concerns over the hazards to workers and the environment from these experiments. Commentors stated that DOE should provide a thorough review of the NIF's mission, environmental risks, proliferation impacts, and ability to achieve its stated scientific goal of ignition. The LLNL SW/SPEIS should provide a cost estimate for NIF experiments, equipment, and design. Details regarding design changes to existing target chamber and construction of expensive inner containment vessels were not provided in the LLNL SW/SPEIS. A commentor questioned the total cost of changes and modifications necessitated in the Proposed Action.

Commentors stated that the NIF appendix fails to adequately describe the programmatic impacts of the proposed experiments. Commentor stated that in the past, DOE denied that they would use fissile materials in NIF experiments. Some commentors suggested that new experiments at NIF be analyzed for reasonable alternatives within the DOE complex-wide SSM program. Other commentors requested the LLNL SW/SPEIS provide an alternative that includes the cessation of NIF operations.

Response: *The NIF mission need is presented in Appendix M, Section M.2 of the LLNL SW/SPEIS. This provides a timeline and summary from the original mission need statement for NIF approved by DOE in 1993 to the present, including the recent NNSA proposal to use plutonium, other fissile materials, fissionable materials, and lithium hydride in NIF experiments. In September 2000, the Secretary of Energy certified to Congress that the NIF supports the SSP and is a vital element in three important ways: 1) Experimental study of issues of stockpile aging or refurbishment; 2) Weapon science and code development; and 3) attracting and training the exceptional scientific talent required to sustain the program over the long term. As indicated in Appendix M, Section M.1.1, in November 2002, the NNSA approved proposing experiments on the NIF using plutonium, other fissile materials, fissionable materials, and lithium hydride. The proposed experiments using these materials directly enhance the ability of NIF to support*

these activities. NNSA facilities and operations, including NIF, are operated in compliance with U.S. nuclear weapons policy.

The experiments will evaluate the physical properties of these materials in support of the SSP. All experiments being considered for NIF that use such materials would do so in extremely small quantities, many orders of magnitude less than would be needed for a nuclear weapon. A statement has been added to Appendix M, Section M.5.3 clarifying those experiments with gram quantities of weapons grade plutonium would be conducted in the NIF target chamber with an inner containment vessel.

NIF experiments will achieve temperatures and pressures needed to evaluate fundamental physical data on special nuclear materials that must still be resolved. This is because past experiments, including nuclear tests, did not fully examine the physical properties of weapons materials, either under the extreme conditions associated with nuclear weapons explosions or with the necessary level of precision required to validate computer models of nuclear weapons performance. These validated models will allow NNSA to assess the effects of aging and engineering modifications of the stockpile and as a result, to certify the safety, reliability, and performance of the stockpile without nuclear testing.

A major goal of NIF is to achieve fusion ignition in the laboratory. The addition of proposed experiments with the previously mentioned materials does not change NIF's basic missions nor affect its scheduled completion. The DOE goals for NIF, of providing a unique facility for SSP experiments and the achievement of fusion ignition with energy gain, remain unchanged.

The life cycle environmental and economic impacts of the NIF are contained in Appendix M. The cost of currently approved NIF operations and experiments are described in each year's annual budget submitted by the President to Congress. The cost of the inner containment vessel for the proposed gram-scale plutonium experiments was not estimated because detailed design work on the inner containment vessel, modification of the target chamber and associated systems will not be initiated until a decision is made on whether to use plutonium in NIF. A pre-conceptual design was performed that supports the environmental evaluation of the proposed experiments in Appendix M.

NNSA has developed an integrated program for SSP weapons physics experiments to be performed at NIF and other NNSA facilities. There are no current or planned facilities in the DOE complex able to perform experiments at the conditions attainable at NIF. Only NIF can achieve the necessary conditions of extreme temperature, pressure, density, and dynamic conditions required for these experiments. NIF remains the only facility that is expected to achieve fusion ignition with energy gain, addressing both SSP and basic energy science needs for the Nation. Canceling NIF would prevent DOE from being able to meet its Stockpile Stewardship Mission. The Proposed Action supports these missions and goals. The purpose and need for the use of the proposed materials is provided in Section M.2.4. That section discusses the complex-wide impacts of NIF and the relationship to the SSP.

The potential impact of the NIF on proliferation is addressed in Comment Response 01.01. For related information on the environmental impacts of NIF operations, see Comment Response 26.03.

- 26.02** Commentors stated that analyzing NIF experiments in the course of the LLNL SW/SPEIS does not comply with the intent of the 1998 court order *NRDC v. Peña*, in which DOE was ordered to prepare a Supplemental SSM PEIS if DOE proposed using certain materials in NIF experiments.

Response: *The course of action that DOE has followed with regard to the Supplemental SSM PEIS complies with the August 19, 1998 court order NRDC v. Peña, Civ. No. 97-936(SS) (D.D.C.). By preparing the Supplemental SSM PEIS and analyzing the reasonably foreseeable environmental impacts of NIF experiments using plutonium, other fissile materials, fissionable materials, and lithium hydride, together with the LLNL SW/SPEIS for continued operation of LLNL, DOE has complied with the court order and has evaluated adequately the potential environmental effects of the Proposed Action, while also complying with its obligations under the NEPA.*

- 26.03** Commentors expressed the following concerns regarding the environmental impacts of NIF operations:

Commentors stated that using plutonium and fissile materials in NIF experiments would increase hazards to workers, public and the environment and that these issues are not adequately addressed in the LLNL SW/SPEIS.

The LLNL SW/SPEIS should address the inner containment chamber insertion and extraction processes in more detail and if this will involve a decontamination of the insertion port, the outer surface of the inner containment vessel, and decontamination of the outer chamber's inner surface. The removal of the inner containment vessel could result in additional personnel exposures. Explain how administrative controls could involve increasing the number of personnel exposed to keep individual worker dose within the administrative limits.

Table M.5.3.13.1–2 should be reformatted and the LLNL SW/SPEIS should reflect the fact that although many isotopes have short half-lives, many others have long half-lives.

Table M.3.2.1–1 identified maximum inventory mass in grams and commentors requested that maximum inventory activity in curies.

Commentor requested an explanation for the mass of particulates in the inner containment chamber listed at the bottom of Table M.5.3.13.1–1.

The term “non-yield” should be defined by a specific threshold of fission yield, as defined by the production of specific flux of prompt fission neutrons.

Additional information should be provided concerning the use of other actinides.

The relative effectiveness of cryopumps cooled with high pressure helium versus liquid nitrogen should be described, and a loss of coolant flow accident should be evaluated. Commentor questioned operation of the accumulation tank for fission products and fission product decay.

Inner containment vessel operations at the Tritium Facility adds effluents that should be accounted for in Appendix M.

Commentor stated that fission products are not produced by neutron activation.

Commentor stated that Section M.5.3.13.1 should be expanded to account for radioactivity in the NIF target bay area and in the Tritium Facility glovebox room where the sealed inner containment vessels will be breached.

Commentor stated that Tables M.5.3.13.1–1 and M.5.3.13.1–2 are missing data and should be revised to include mass numbers for materials generated during NIF experiments.

Lithium hydride hazards are not fully analyzed in the LLNL SW/SPEIS.

The LLNL SW/SPEIS should describe the gases and semi-fissionable by-products being released to the environment by proposed NIF experiments.

Commentors expressed concern about the criticality aspects of NIF experiments.

Commentor suggested that the NIF accident study does not account for anything other than fatalities.

Commentor stated that more detail should be provided on the definition of other fissile materials and specially prepared plutonium.

Commentor expressed concern regarding a 30 percent increase in radiation dose from the Proposed Action versus the No Action Alternative. Appendix M, Section M.3.1.4 states that neutrons from fusion experiments would penetrate the roof of the facility and cause skyshine radiation where neutrons scatter back down to the ground. Other neutrons would interact with structural materials and emit gamma rays that would reach the ground. Are better building materials available for use in the roof or structure that would trap the neutrons before escaping into the atmosphere and ground?

Commentor requested information on the results of yield experiments using depleted uranium in Section M.5.2.13.1 from the No Action Alternative.

Commentor stated that plutonium would be fissioned and vaporized in NIF experiments.

Commentor expressed concern about public exposure from the transportation of NIF materials.

Commentor was of the opinion that the manner of operation of the NIF Laser and Target Area Building would not be the same in the No Action and Proposed Action alternatives.

Response: *Appendix M evaluates the reasonably foreseeable environmental impacts to workers, the environment, and the public from the proposed use of plutonium, other fissile materials, fissionable materials, and lithium hydride.*

The use of the inner containment vessel for plutonium experiments would result in worker dose from direct radiation from activated components and contamination during insertion and removal activities, exposure during transportation, and inspection and packaging operations at the Tritium Facility. Administrative controls including the use of protective clothing and equipment, radiation monitoring, use of contamination control practices, and a formal ALARA program would be used to minimize worker radiation dose. Information on the controls used at LLNL to protect personnel during radiological operations is included in Chapter 4, Section 4.16.2.2. The detailed operational aspects of the inner containment vessel insertion and extraction would be developed during the operational phase of this activity.

The analysis in Appendix M included isotopes that significantly impact the environmental analyses. Because of the very large number of isotopes, the tables were restricted to the predominant contributors to the fission product dose including those with release fractions orders-of-magnitude greater than the solid fission products. The fission products (in total) are not the major contributors; the combined doses from tritium (500 curies) and the actinides (particularly weapons grade plutonium) dominate the accident dose. Furthermore, the solid, long-lived fission products constitute a small fraction of the total fission product dose. Accordingly, the lack of complete accounting of every fission product isotope has a less than two percent impact on the total dose. Therefore, the long-lived isotopes such as cesium-137 and strontium-90 are not included in Table M.5.3.13.1–2. The comment that the table requires reformatting has been addressed and the table has been reformatted for the Final LLNL SW/SPEIS.

The maximum inventory in grams and curies is contained in Appendix M, Table M.5.3.13.1–1 and would not add to the clarity of the discussion in Table M.3.2.1–1.

The listed particulate quantity of 225 grams is the mass of material ablated from the interior surfaces of the inner containment vessel from a single 45 megajoules experiment. This clarification has been added to Appendix M, Section M.5.3.13.1.

Non-yield experiments are defined as experiments which do not have tritium and deuterium in the target and generate no measurable neutrons from fusion reactions. This has been added to Chapter 11, Glossary.

The use of “other actinides” is bounded by the analysis in Appendix M.

The NIF target chamber cryopumps have three stages. The first stage is cooled by liquid nitrogen to 80 Kelvin. The second and third stages are both cooled to 15 Kelvin by high-

pressure helium. Both liquid nitrogen and high-pressure helium are used as cooling media for trapping material. Some fission products would be created during experiments involving fissile (e.g., uranium-235) or fissionable (e.g., uranium-238) materials in the presence of yield produced by inertial fusion targets without inner containment, and some would be eventually released to the environment as part of normal operations. Many of these fission products are short-lived, and would decay while still being held in the cryopump system that has liquid nitrogen and high-pressure helium final stage cooling. Alternately, they can be discharged to the accumulation tank and held until they have decayed. Both the cryopumps and the accumulator provide this hold-up process capability for the short-lived fission products. The loss of coolant to the cryopumps could raise the pressure in the target chamber but would not result in a release of radioactive material because there is no release path. The bounding accident is the unlikely occurrence of a beyond-design-basis earthquake immediately after a yield experiment that breaches the target chamber releasing the entire inventory of radioactive material. The quantitative amount of fission products would have decayed by a factor of 50 if they were discharged to the accumulation tank and held for 30 days. The quantitative amount of solid fission products that would be retained in the target chamber at the end of 1 year would be less than 1 milligram.

The tritium contained in the four proposed experiments with weapons grade plutonium in the presence of yield would be 8 curies in any year. The tritium released from NIF containment operations in the Tritium Facility are a part of the releases identified in the LLNL SW/SPEIS for the Proposed Action. The NIF tritium would represent less than 5 percent of the total tritium release from the Tritium Facility. The accompanying volatile and semi-volatile fission products if all released through the stack would have a dose contribution substantially less than the tritium contribution.

The statement on fission products not being produced by neutron activation has been rewritten in Appendix M, Section M.5.3.8.4.

Radioactivity in the NIF target bay area is covered in Appendix M, Section M.5.3.13.1. Operations at the Tritium Facility are covered in the LLNL SW/SPEIS in Chapter 5, Sections 5.3.8, 5.3.13, and 5.3.14 for Air Quality, Materials and Waste Management, and Human Health and Safety, respectively.

Section M.5.3.13.1, has been developed to include the additional inventories that would result from use of the new Proposed Action materials and additional quantities of depleted uranium and beryllium. The tritium and main chamber particulates would be the same as for the No Action Alternative and would be included in the Proposed Action. Because of the very large number of isotopes, the tables in this section were restricted to the predominant contributors to the fission product dose including those with release fractions orders-of-magnitude greater than the solid fission products.

Appendix M analyses the use of lithium hydride in NIF experiments under the Proposed Action. These experiments would involve gram and sub-gram quantities of lithium hydride or lithium deuteride. Lithium hydride is hazardous and can combust; however in

the gram quantities that are involved in the proposed experiments, lithium hydride can be handled safely. Additional information on the exposure to personnel from the use of lithium hydride can be found in Appendix M, Section M.5.3.14.2. Information on the accidental release of lithium hydride can be found in Appendix M, Section M.5.6.2.2.

Gases and semi-volatile fission products are part of the evaluation of the radioactive release to the atmosphere in Sections M.5.3.8.4 and M.5.3.14.1. These are accounted for in the radiological releases that are estimated to result in no LCFs to the public or workers. The total NIF radioactive emissions from the stack are 45 curies per year (30 curies are tritium). This results in a site boundary dose of 0.27 millirem per year to the maximally exposed person (compared to 300 millirem natural background radiation) and would be expected to result in no LCFs to the public. The stack will be continuously monitored for radioactive effluent.

The quantities of plutonium and highly enriched uranium used in these experiments are too small to experience criticality under the highest temperatures and pressures generated by the NIF.

The methodology of accident analysis and human health and safety are discussed in Appendix D and Chapter 5, Section 5.1.14. The accidents and the resulting fatalities are analyzed to provide the consequences of bounding accidents. Additional information is included in Comment Response 23.02.

The Proposed Action would involve experiments with other fissile materials. The inventories of any future fissile material experiments would be limited, such that their environmental impacts are bounded by the environmental impacts of the proposed use of highly enriched uranium without containment or weapons grade plutonium with containment. Specially prepared plutonium refers to the combination of quantity and isotopic content that could be fielded in NIF experiments without inner containment, while ensuring that the environmental impact of these experiments are bounded by the impact of proposed experiments using highly enriched uranium.

The 6-foot-thick concrete shielding around the target bay was designed to minimize exposure to workers and the public. The 30 percent increase in dose is caused by fission products and not by neutron skyshine. This increase results in no additional LCFs. Refer to Appendix M, Section M.5.3.8.4 for additional information.

There are no yield experiments with depleted uranium considered in the No Action Alternative and therefore no fission products.

Fission products generated from NIF experiments are analyzed in Appendix M. The proposed experiments with plutonium range from those in which the material remains solid to those in which the plutonium could be vaporized. The impacts are included in Appendix M, Section M.5.

The transportation accidents are discussed in the Appendix M, as is exposure from normal transportation. Both impacts are very small and result in no projected LCFs. The dose that the truck driver receives during normal operation is negligible and the driver is with the material throughout the trip, the dose received by a member of the public standing next to the truck would be less (proportional to the time spent versus the time the driver spends).

The operation of the target chamber differs in handling the inner containment vessel but the laser system and basic building operation are largely unaffected as described in Appendix M, Section M.3.1.

26.04 Commentors expressed concerns regarding the environmental impacts of NIF's use of tritium.

Many commentors expressed concern that producing targets at LLNL will increase the amount of tritium that is used in the Tritium Facility from just over 3 grams to 30 grams, which is nearly a 10-fold increase. Commentor stated that the proposed tritium increase is inconsistent with plans described in the SSM PEIS. The prior document determined that tritium targets were to be fabricated offsite because the operation would be conducted in a highly populated area. No justification for the departure from the original NIF EIS has been offered in the LLNL SW/SPEIS. Commentors requested that DOE revise the LLNL SW/SPEIS to include the purpose and need for manufacturing tritium targets onsite at LLNL.

The amount of curies released per year to the environment from NIF operations may need an upward revision because the maximum annual throughput is given as 1,750 curies per year. For example, the 30 curie value shown in Table M.5.2.8–3 is approximately 7,000 times the value shown for activated air production and emissions. Analysis should be based upon annual tritium emission of at least 100 curies.

Regarding page M-49 of the Draft LLNL SW/SPEIS, the LLNL SW/SPEIS should state that nearly all targeted tritium will end up in the waste stream or the atmosphere. The “tritium collection system” should be explained in greater detail.

Regarding page M-68 of the Draft LLNL SW/SPEIS, tritium gas should be included in Table M.5.3.13.1–2. Also, tritium removal by high-vacuum cryopumps should be described and analyzed.

Commentor expressed concern regarding the possibility of an accidental breach of a tritium firing chamber.

Since removal of first wall panels is only planned for every eight years, tritium contamination will build up over time, therefore, annual attempts to clean chamber surfaces could be quite difficult.

Commentor stated that Appendix M, Section M.5.2.13.1 misreferences Section M.5.2.8.4.

Response: *The purpose and need for NIF is provided in Appendix M, Section M.2. In the SSM PEIS, DOE analyzed target fabrication at offsite locations, such as LANL, as the bounding case. The SSM PEIS included transportation evaluations to identify the environmental impacts of transporting the targets filled with tritium from offsite facilities to LLNL. At the time of the SSM PEIS, DOE had not determined where targets would be filled. NNSA now proposes to fill NIF targets in the LLNL Tritium Facility as well as receiving targets from offsite locations. The LLNL SW/SPEIS analyzes target fabrication at the Tritium Facility and includes the resulting environmental impacts. See Comment Response 34.01 for information on the increase in the tritium limits and the environmental impacts at the Tritium Facility.*

The SSM PEIS (DOE 1996a) and the LLNL SW/SPEIS describe the tritium confinement system: target chamber and tritium processing system. The tritium processing system recovers unburned tritium from experiments using dryer beds and is described in Appendix M, Section M.5.2.13.3.1. The use of this system is expected to result in tritium emissions of no greater than 30 curies based on a throughput of 1,750 curies per year in experiments. These emissions will be monitored continuously.

Not all target tritium ends up in the waste stream or the atmosphere because some of the tritium is burned. Based on the assumption of a 20 megajoules yield, approximately 20 percent of the tritium is consumed in the fusion reaction. Approximately 80 percent of the tritium will appear in the waste stream. This includes tritiated water absorbed on the molecular sieve traps, the tritium bound to the chamber first walls and debris shields, radioactive waste stream, and tritium adsorbed on the surfaces of vacuum components. The request to provide details of the tritium collection system is referred to Appendix M, Section M.1.2, where the tritium processing system, which recovers tritium on molecular sieve traps, is described in sufficient detail for the purpose of environmental evaluation.

In Appendix M, Section M.5.3.13.1, a sentence has been revised deleting information stating that tritium and deuterium are included in Table M.5.3.13.1–2.

The NIF target chamber cryopumps have three stages. The first stage condenses water including tritiated water. The second stage condenses other vapors except hydrogen, helium, and neon. The third stage is a bed of activated carbon where hydrogen, tritium, helium, and neon are cryoadsorbed. Additional information can be found in Comment Response 26.03.

A complete breach of the tritium firing chamber is evaluated in Appendix M, Section 5.6, in which a postulated beyond design basis earthquake occurs at the same time as a maximum yield shot breaching the target chamber and releasing the inventory to the atmosphere. The consequences of this bounding accident are no projected LCFs to the public.

It is anticipated that the first wall panels will be removed and cleaned annually. The estimated lifetime of the first wall panels is 8 years.

The reference to Radiological Air Quality in Appendix M, Section M.5.2.13.1 has been corrected and now refers to Section M.5.2.8.

26.05 Commentor stated the following technical and engineering issues:

Commentor stated that Table M.5.3.13.1–2 is poorly formatted and missing fission product radioisotope data. This omission needs to be rectified in the Final LLNL SW/SPEIS. The public should be given an explanation for the omission, and discuss how the impact analysis would be affected.

Regarding page M-13 of the Draft LLNL SW/SPEIS, NIF Operations Facility Utility Usage, the list of utilities should include the high vacuum system. Also, Section M.3.1.2, Laser Operation, should include another bullet item under annual total yield of 1,200 megajoules per year. The new bullet item should provide the total energy usage of the facility of approximately 500,000 megajoules per year.

Commentor requested additional information on Target Chamber and associated system design changes required because of proposed NIF experiments.

Commentor stated that additional information be provided on the advanced design and planning of the special glovebox.

Commentor found many distortions, errors, and omissions regarding radionuclide materials management. The LLNL SW/SPEIS ignores the contribution of many other radioactive sources. Also, exposure management would require interim cleanup actions and rotating personnel to minimize individual doses and limit dispersal of contamination. Commentor stated that trapped tritium should be included in Table M.5.2.13.1–1.

Commentor stated that the decision to use oil-free pumps is based on a 1998 plan. The LLNL SW/SPEIS also states that there is still uncertainty about the technology and resulting vacuum pump oil volume.

Table M.5.3.8.4–1 should include a third column containing the half-lives of the listed elements. Another footnote should be added that specifies that the table is based upon equally spaced experiments, beginning 1 year before the derived integrated values.

Commentor stated that Table M.5.3.13.1–2 contains seven sets of data and time frames, format, and lack of detail.

Response: *The high vacuum system is not a facilities utility and therefore is not listed in Appendix M, Section M.5.2.12. The facility electrical power consumption along with other utilities is found in Appendix M, Table M.3.4–1. The majority of the electrical*

consumption is for the heating and ventilation systems to maintain precise temperature, humidity, and cleanliness conditions in the NIF building.

Possible modifications to the NIF target chamber and associated systems to accommodate the proposed inner containment vessel have not been designed in detail, nor has the design of the inner containment vessel for plutonium experiments. The detailed design would proceed only after the NEPA determination is complete with a published ROD. The determination has been made that the inner containment vessel will fit through the currently existing large port on the chamber equator. Appendix M, Section M.3.2.1 describes changes to the current target chamber (addition of hard points for seismic support of the inner containment vessel), and the target area (installation of tracks from the Diagnostic Building and a custom built manipulator).

The special glove box is listed in Appendix M, Section M.3.2.1 and would be needed in the Tritium Facility to retrieve samples from the inner containment vessel and to decontaminate and dismantle it, as necessary, prior to shipment to the NTS. The potential worker exposure to radiation from the use of the glove box is included in the NEPA determination as part of the 4 person-rem per year estimates for worker dose in Appendix M. The detailed design of the inner containment vessel would proceed only after the NEPA determination is complete.

The proposed new paragraphs for Appendix M, Section M.5.2.13.1 (written by the commentor) have been reviewed and because they are associated with the No Action Alternative, with no experiments with plutonium and no fission products, the proposed additions are not warranted. Comments on the format and content of Table M.5.2.13.1–1 request fission products. Fission products are not included because they are not generated in the No Action Alternative. Tritium that is absorbed or embedded on the target chamber surface is not released and is not listed in this table.

The NIF vacuum pumps do not expose oil to tritium; therefore, there is no need to increase mixed waste projections.

In general, the listed isotopes in Table M.5.3.8.4–1 have relatively short half-lives (less than one day). The exceptions are krypton-85 and iodine-131, which have half-lives of 10.8 years and 8 days, respectively. Radioactivity from long-lived isotopes does not add any significant impact because the dose is dominated by volatile fission products with shorter half-lives. The statement in Appendix M, Section M.5.3.8.4, referring to possible sources of fission product emissions, has been deleted to be consistent with footnote “b” of the table.

Responses to comments on format and editorial concerns are addressed in Comment Response 26.06. See Comment Response 26.03 for information concerning Table M.5.3.13.1–2.

26.06 Commentor stated the following format and content issues as follows:

Commentors requested word and formatting changes and definitions to several sections of Appendix M. Commentor requested quantifying the increase in low-level waste related to filters between the Proposed Action and No Action Alternative.

Design, construction, and instrument costs associated with the neutron spectrometer should be fully accounted for as a part of NIF costs. Additional information should be provided for the need of the neutron spectrometer.

Commentor stated that the phrase “fissile materials” or “fissionable” materials should be removed. If not, add fissionable to the glossary and expand the list of fissile materials in the glossary.

Response: *Suggested word and formatting changes and definitions to Appendix M were reviewed and the existing wording was found to be adequate. Therefore, these comments did not result in changes to Appendix M. There is a 0.04 cubic meter per year increase in filter waste. The added filter waste results in less than a 0.1 percent increase in the total annual low-level waste generation.*

The neutron spectrometer would provide a sensitive and accurate measure of the neutrons generated in ignition experiments with yield at NIF. Neutron spectrometers are standard diagnostic instruments at other DOE facilities. The neutron spectrometer would not be required until after the early campaigns of sub-ignition NIF fusion experiments are completed. A preconceptual design sufficient to describe the excavation quantities of hazardous and toxic materials and protection of the groundwater has been completed to support the evaluation of the environmental consequences of construction and operation including the manpower to support the socioeconomic evaluation. The cost of the neutron spectrometer can be estimated, but is not precisely known at this time. It would eventually be based on a detailed design that could only be undertaken after this NEPA determination is completed with the publication of a ROD.

Fissile and fissionable materials are separate categories and therefore not redundant. Definitions have been added to the Glossary in Volume I, 1) fissile materials are isotopes that readily fission after absorbing a neutron of any energy, either slow or fast and 2) fissionable materials are materials that will undergo nuclear fission when exposed to fast neutrons.

26.07 Commentors stated the following comments concerning waste generated by NIF.

Commentors suggested that the NIF portion of the waste generated in Building 331 should be included in the NIF waste numbers.

The LLNL SW/SPEIS does not analyze potential problems that would prevent the target chambers from being accepted at the NTS for burial (i.e., mixed waste).

Response: *The additional waste streams generated by the handling of the inner containment vessel in the Tritium Facility (Building 331), such as contaminated inspection tools, form a small addition to the overall Tritium Facility waste streams. These are accounted for in Appendix B, which provides the cumulative impact of all waste streams. The inner containment vessel is accounted for in Appendix M, Section M.5.3.13.*

Based on the experiments analyzed in Appendix M, the inner containment vessel with the residual material from the proposed experiments would meet the NTS waste acceptance criteria for low-level radioactive waste. The contamination within the inner containment vessel would meet acceptance criteria for both radioactive materials (i.e., less than 100 nanocuries per gram concentration) and nonradioactive materials (i.e., nonhazardous materials in form or concentration that do not meet either Resource Conservation and Recovery Act of 1976 or California-only hazardous waste criteria). Appropriate sampling and analysis would be completed on each of the inner containment vessels before disposal.

27 INTEGRATED TECHNOLOGY PROJECT

27.01 Commentors stated that the purpose and need for plutonium Atomic Vapor Laser Isotope Separation (AVLIS) is not adequately discussed in the LLNL SW/SPEIS. Some commentors stated that AVLIS technology provides a bridge between civilian nuclear fuel cycles and weapons production. Commentor questioned the need to produce weapons grade plutonium. DOE should evaluate other alternatives to the ITP, such as locating the facility at another site.

Many commentors expressed concern and opposition over the proposed AVLIS, the concerns centered around three issues: 1) the plans to increase the amount of plutonium that can be used in a single room in the Superblock, 2) the health risk of the use of plutonium in this project, and 3) it would increase the potential for nuclear proliferation. Commentors supported ITP and AMP and did not believe that there would be a health risk.

Commentors stated that the AVLIS project has been secretly and illegally revived.

Response: *DOE/NNSA disagrees that the AVLIS project has been secretly and illegally been revived. Furthermore, NNSA has reconsidered its requirements and determined that there is no reasonably foreseeable need to pursue either the AMP or ITP. Therefore, the AMP has been removed from the No Action Alternative and ITP has been removed from the Proposed Action as discussed in Chapter 1, Section 1.8 and Chapter 3, Section 3.3.3. The impacts throughout the LLNL SW/SPEIS have been revised reflecting these changes.*

For information concerning the increase in MAR and health risk from normal operations, see Comment Response 33.01. For information regarding nuclear nonproliferation, see Comment Response 01.01.

- 27.02** Commentors have called for cancellation of the ITP because it would cause an increase in plutonium MAR from 20 kilograms to 60 kilograms. Commentors believe the ITP is unsafe, an environmental threat to the people of California, a risk to health, will increase air pollution, increase exposure, and will increase generation of TRU waste. Commentors want to decrease MAR. A commentor stated that the hazards are inadequately examined in the LLNL SW/SPEIS. Commentors suggested that the accident analysis for the ITP be redone.

Commentors also noted that the LLNL SW/SPEIS should specify what plutonium isotopes will be harvested and for what purposes. There is no analysis for alternate methods of producing plutonium.

The LLNL SW/SPEIS should identify why environmental evaluations were based on 60 kilograms MAR and not the potential plutonium increase of 120 kilograms. Regarding Table N.5.2.5–2, justification is needed for assuming a collective dose rate of 1 millirem per hour, as opposed to 4 millirem per hour. A commentor questioned the adequacy of NEPA review for deciding to run plutonium in the engineering demonstration hardware.

Response: *NNSA has reconsidered its requirements and determined that there is no reasonably foreseeable need to pursue either the AMP or ITP. Therefore, the AMP has been removed from the No Action Alternative and ITP has been removed from the Proposed Action. Changes have been made in Chapter 1, Sections 1.5.2, 1.5.3, and 1.5.4 and Chapter 3, Sections 3.3.2, 3.3.3, and 3.3.4 in the Proposed Action. These revisions include changing the proposed increase in the administrative limit for plutonium to 1,400 kilograms (compared to 1,500 kilograms in the Draft LLNL SW/SPEIS) and changing the proposed increase in the MAR limit to 40 kilograms (compared to 60 kilograms in the Draft LLNL SW/SPEIS). Chapter 1, Section 1.8 summarizes the changes made from the Draft LLNL SW/SPEIS. The impacts of the removal of AMP and ITP are reflected in Chapter 5, Appendix B, Appendix D, and Appendix J. For information concerning the increase in MAR and health risk from normal operations and accidents see Comment Response 33.01.*

- 27.03** Commentors expressed concern regarding the waste stream created at the proposed ITP. The original 1995 WIPP certification and baseline inventory report does not include the disposal of TRU waste. Commentor stated that the ITP appendix should provide a cost-benefit analysis of the different waste disposal activities discussed in the LLNL SW/SPEIS. Commentor questioned the basis for assuming that LLNL will receive feed materials from which americium have been completely removed from Hanford and Savannah River Site. This assumption is unrealistic and needs to be justified or changed. A commentor suggested that Appendix N evaluate exposure from shipment of TRU waste from ITP.

Response: *NNSA has reconsidered its requirements and determined that there is no reasonably foreseeable need to pursue either the AMP or ITP. Therefore, the AMP has been removed from the No Action Alternative and ITP has been removed from the Proposed Action. The impacts in the LLNL SW/SPEIS have been revised reflecting these*

changes. As a result of this change the waste analysis in the LLNL SW/SPEIS has been updated in Chapter 3; Chapter 5, Sections 5.2.13 and 5.3.13; Appendix B; and Appendix J. Responses to other waste issues can be found in Comment Responses 22.01 through 22.07.

28 POLLUTION PREVENTION

- 28.01** Commentor stated that DOE should revise its Storm Water Pollution Prevention Plan (SWPPP) to include the new locations of operations. In addition, post construction stormwater management controls should be included in the SWPPP, as appropriate, to limit discharge of sediment.

Response: *LLNL's SWPPPs are based on activities that have the potential to pollute stormwater, and Best Management Practices (BMPs) are applied to minimize pollution. Operations at new facilities would be evaluated to determine whether or not the existing BMPs apply. If not, the SWPPPs would be revised to include new industrial activities and BMPs. Sediment control measures are included in the industrial activity SWPPPs to address sediment sources from routine operations, such as grounds maintenance. Post construction stormwater management controls are required by the California General National Pollution Discharge Elimination System (NPDES) permit for stormwater discharges associated with construction activities. These controls would be addressed in the project-specific construction SWPPPs, as required.*

29 EMERGENCY RESPONSE

- 29.01** Commentor requested that agreements and arrangements made with fire protection, police, and security and emergency services for incidents be available in order for the community to evaluate their adequacy. The LLNL SW/SPEIS should also provide information on the adequacy of emergency response preparation. Commentor also requested emergency services information along the planned transportation routes in California for hazardous and radioactive materials/waste shipments and capabilities for responding to a major accident or terrorist attack against these shipments. Commentors questioned the availability of emergency personnel following a crisis.

Commentor stated that the LLNL SW/SPEIS should categorize the types of accidents involved in the Emergency Response Summary (1999-2002) and how they were addressed.

Response: *Emergency response agreements have been negotiated and signed with state, county, and local municipal officials. For a list of those agencies see Appendix I, Section I.1.2. The LLNL Emergency Plan (LLNL 2003a) describes the LLNL Emergency Response Organization and the interfaces and agreements between DOE, NNSA, and other Federal Agencies; California State Government such as the Governors Office of Emergency Services and the California Highway Patrol; and local emergency response organizations. The plan describes the responsibilities of personnel in the Emergency*

Response Organization and describes the coordination that would take place in the event of an emergency using available emergency response personnel.

The analyses in the LLNL SW/SPEIS do not require a more detailed categorization or listing of how the response calls were addressed. NNSA believes the categorization in Chapter 4, Table 4.4.1.1–1 Summary of Response Calls for 1999 through 2002 adequately reflects the nature and quantity of emergency responses. Hazardous material Operational Emergencies may be classified in order of increasing severity as an Alert, Site Area Emergency, or General Emergency as defined in the LLNL Emergency Plan.

The accident analyses in Appendix D are conservative with little or no credit taken for existing preventative and mitigative features in each building or operation analyzed or for the safety procedures that are mandatory at LLNL. As stated in Section D.2.2.1, the accident analyses in Appendix D do not take credit for emergency response and protective actions in their evaluation of consequences. The evaluations of intentional attacks are contained in classified and official use only documents. The information in these documents is used to train and evaluate emergency response and protective force personnel. Disclosure of information regarding potential vulnerabilities, postulated modes of attack, methods of deterring such attacks, and possible consequences of an attack could be used by terrorists to plan attacks.

Shipments of TRU waste follow planned routes coordinated with the state of California and the Western Governors' Association. Special nuclear material (SNM) shipments are escorted and the specific schedules and transportation routes are classified or for official use only. DOE has established emergency response programs for transportation of TRU waste and SNM. The impact of transporting TRU waste and SNM is analyzed in Appendix J. Offsite transportation accidents are analyzed in Appendix J and onsite transportation accidents are analyzed in Section D.2.4.15. These analyses conservatively bound the environmental impacts of the reasonably foreseeable LLNL shipments of waste and SNM.

30 SECURITY

- 30.01** Commentor expressed concern regarding terrorist attacks and security at LLNL. Commentors stated that it is important that information regarding terrorist attacks and Superblock security be made public. The analysis should include the extent of casualties and contamination in the event of a successful terrorist attack. Another commentor stated that the LLNL SW/SPEIS should have considered the most basic terrorist attack, such as a crash into the Superblock building from a truck loaded with explosives. A comparative analysis of the alternatives for continued operation of LLNL would contrast the consequences from 20 kilograms versus 60 kilograms of plutonium subject to blast and fire from such an explosion. Some commentors expressed concern regarding how radiological or biological material would be secured in the event of an accident. The LLNL SW/SPEIS should discuss a range of intentional attack scenarios (e.g., terrorist, theft, sabotage) and provide a qualitative consequence analysis. This is recommended by DOE Office of NEPA and Policy Compliance, Recommendations for Analyzing Accidents Under NEPA, Final Guidance, July 2002, Attachment 1.

Commentor asked for an explanation of how radioactive material will be secured when transported and used outside the Superblock. Some commentors expressed concern about making the Bay Area an attractive target for terrorists; and questioned LLNL's readiness to protect citizens in the event of a terrorist attack. Another commentor requested we add terrorist threats of theft as an environmental and public health concern. The Livermore Site is highly vulnerable to an external attack and is not an appropriate place for storing and processing nuclear explosive materials. Intentional terrorist acts could cause a potential release and should be analyzed in the LLNL SW/SPEIS.

Response: *It is not possible to predict whether intentional attacks would occur at LLNL or at other critical facilities, or the nature of the types of attacks that might be made. Nevertheless, NNSA reevaluated scenarios involving malevolent, terrorist, or intentionally destructive acts at LLNL in an effort to assess potential vulnerabilities and identify improvements to security procedures and response measures in the aftermath of the attacks of September 11, 2001. Security at NNSA and DOE facilities is a critical priority for the Department, and it continues to identify and implement measures designed to defend against and deter attacks at its facilities. In March 2004, DOE's Office of Safeguards and Security Evaluations completed a special department-wide review at LLNL that included performance testing LLNL's Protective Force. LLNL was given a rating of "Effective Performance," which is the highest one possible.*

Substantive details of terrorist attack scenarios and security countermeasures are not releasable to the public, since disclosure of this information may be exploited by terrorists to plan attacks. The information in these documents is used to train and evaluate emergency response and protective force personnel.

- 30.02** Commentor expressed concern that security systems and personnel are inadequate. The LLNL SW/SPEIS should respond to DOE Secretary Abraham's comments regarding the vulnerability of securing nuclear materials at LLNL and discuss past security deficiencies. The LLNL SW/SPEIS needs more detail concerning security force's screening, training, number of officers, hours worked, and available equipment. DOE should provide an unclassified security analysis that covers the classified security information that was not provided to the public. Commentors questioned why the unclassified and detailed Government Accounting Office (GAO) and Project on Government Oversight (POGO) reports were not referenced in the LLNL SW/SPEIS.

Response: *DOE continuously evaluates security measures at LLNL and provides improvements as necessary. Details concerning security are classified and beyond the scope of this LLNL SW/SPEIS.*

Only documents used in the preparation of the LLNL SW/SPEIS were included as references.

31 REGULATORY COMPLIANCE

31.01 Commentors stated that the LLNL SW/SPEIS fails to assess a range of reasonable alternatives, as required under NEPA. Commentors indicated the difference between the No Action and the Reduced Operation alternatives is not clearly defined in the LLNL SW/SPEIS. One commentor asserted that the alternatives are “sham constructs” because environmental impacts do not significantly differ between alternatives. The LLNL SW/SPEIS only considers extremes and does not evaluate reasonable alternatives to develop an informed agency decision. DOE must examine a true alternative based on a zero case, in conformity with the requirements of the NPT. DOE has failed to analyze the need for the Proposed Action and impacts of these actions. Commentors suggested that the alternative of “delaying the project” needed to be considered. Commentors questioned if LLNL staff made alternative proposals that were not discussed in the LLNL SW/SPEIS. Commentors stated that the LLNL SW/SPEIS should provide justification that the NIF, Building 332, and Terascale are necessary to maintain the Nation’s nuclear weapons stockpile. Commentors stated that there should be an alternate method of maintaining a nuclear deterrent other than returning to the spending levels and programs of the Cold War. There is, however, no such alternative analyzed in the LLNL SW/SPEIS.

Commentor stated that the LLNL SW/SPEIS should clarify the relationship between each project’s final preferred alternatives; disclose impacts of reasonable scenarios that have not been addressed; and identify how decision-making for the respective projects is expected to proceed.

Response: *The LLNL SW/SPEIS analyzes alternatives considered reasonably foreseeable by NNSA that respond to the programmatic purpose and need. As indicated in Chapter 1 of the LLNL SW/SPEIS, LLNL is responsible for maintaining the safety, security, and reliability of the Nation’s nuclear stockpile as part of the NNSA’s SSP. As described in Section 1.3, the continued operation of LLNL is critical to NNSA’s SSP and to preventing the spread and use of nuclear weapons worldwide. LLNL conducts a wide range of stockpile surveillance activities to assess the safety and reliability of weapons in the stockpile and to better understand the effects of aging on weapons. These surveillance activities include evaluating the pits in the primaries of nuclear weapons. LLNL is the design laboratory for four weapons systems in the stockpile: the W87 and W62 intercontinental ballistic missile warheads, the B83 bomb, and the W84 cruise missile.*

The Proposed Action evaluates the environmental impacts of weapons and non-weapons new initiatives, activities, projects, and facilities construction projected at LLNL for the foreseeable future (nominally 10 years). Those environmental impacts are compared with the No Action and the Reduced Operation alternatives to provide the decisionmaker with a range of alternatives needed for an informed choice. Figures S.5–1 and 3.1–1 have been amended to better clarify the differences between the alternatives.

As stated in Chapter 3, Section 3.2, the No Action Alternative was analyzed to comply with CEQ’s NEPA implementing regulations (40 CFR Parts 1500-1508), providing a

baseline against which the impacts of the Proposed Action and Reduced Operation Alternative can be evaluated. The No Action Alternative is to continue the current authorized level of operation; it evaluates ongoing programs and operations, including approved interim actions, facility construction, facility expansion or modification, and facility D&D for which NEPA analysis and documentation already exists. The No Action Alternative accounts for the fact that LLNL has been an operational DOE laboratory for more than 50 years, with continuing missions expected for the foreseeable future. The No Action Alternative would be equivalent to the “delay” alternative described by commentors.

The Reduced Operation Alternative represents an approximate 30 percent reduction in SSP activities at LLNL. Specific activities, for which there is current NEPA approval, are proposed for reductions to a level that provides only for mission readiness (i.e., can be ramped up to full operation if required). Requests for further reductions, to include elimination of all nuclear weapons related activities, are inconsistent with LLNL’s DOE assigned mission in the SSP (see Chapter 3, Section 3.5 of the LLNL SW/SPEIS for a more detailed discussion). No new proposals or activities beyond those with existing NEPA approval are included in this alternative. Although the environmental impacts associated with some resources may not significantly differ, DOE thinks that a range of reasonable alternatives was considered given the purpose and need of the LLNL SW/SPEIS.

The LLNL SW/SPEIS and associated reference documents provide justification that the NIF, Building 332, and Terascale are necessary to maintain the Nation’s nuclear weapons stockpile. Chapter 3, Section 3.5, discusses alternatives such as shutting down LLNL and/or converting LLNL to an academic or environmental research laboratory. As discussed in that section, these alternatives were considered, but eliminated from detailed study because they would not satisfy the purpose and need for the Proposed Action. The LLNL SW/SPEIS analyzes a range of reasonable alternatives based on NNSA’s review of its programmatic needs, not based on recommendations of individual LLNL staff. With respect to the preferred alternative, Section 3.7 now identifies the Proposed Action as the preferred alternative. See Comment Response 01.01 for information concerning the NPT.

The LLNL SW/SPEIS distinguishes the specific impacts for the use of the proposed materials in NIF and the site-wide impacts of the proposed actions listed in Chapter 3. The specific impacts of using the proposed materials on NIF are identified in Appendix M. The site-wide impacts for the Proposed Action, including NIF’s use of the proposed materials, are identified for each of the resource areas in Chapter 5.

The decision as to which NNSA will take, will be announced through the issuance of a ROD. The ROD would be issued no sooner than 30 days after the Final LLNL SW/SPEIS is filed with the EPA. The ROD will state what decisions have been made and identify all alternatives considered by the agency in reaching these decisions, specifying the alternatives which were considered to be environmentally preferable. Additionally, the ROD may discuss preferences among alternatives based on relevant factors including

economic and technical considerations and agency statutory missions. The ROD will also identify and discuss all such factors including any essential considerations of national policy, which were considered by the agency in making its decisions and state how those considerations entered into these decisions.

- 31.02** Several commentors stated that the comment period did not allow for sufficient review of this complex 2,000-page document and ask for extensions. Another commentor requested that DOE provide additional public hearings.

Commentors contended that the LLNL SW/SPEIS underestimates long-term, cumulative, and reasonably foreseeable impacts and suggested that the analysis cover more than 10 years.

Commentors requested technical appendices. Another commentor questioned the need to complete the LLNL SW/SPEIS, provide reasonable alternatives, and render a decision when there are still unknowns and concerns for finding disposal paths for waste. A commentor stated that there is no explanation for waiting an extra two years relative to the 1997 supplement to prepare this LLNL SW/SPEIS.

Commentors questioned whether their comments would be considered.

Response: *DOE/NNSA complied with all applicable laws, regulation, and guidance regarding the preparation of the LLNL SW/SPEIS. The comment period for the Draft LLNL SW/SPEIS was 90 days, which is twice as long as the CEQ 45-day requirements. DOE/NNSA believes the 90-day comment period was adequate. In addition, five public hearings were held during the 90-day comment period, which provided a brief discussion of the LLNL SW/SPEIS and an opportunity for questions and answers as well as an opportunity to comment on the Draft LLNL SW/SPEIS. Moreover, all comments were considered equally, whether submitted during a public hearing, letter, fax, or e-mail. Following the comment period, NNSA considered all comments received and made changes to the Draft LLNL SW/SPEIS, as appropriate. This Comment Response Document contains all comments received up to two weeks after the close of the public comment period and DOE/NNSA responses to these comments. Comments received more than two weeks late were also considered although were not specifically included in Chapter 2 of this Comment Response Document. All unclassified references for the LLNL SW/SPEIS were made available in the DOE/LLNL reading rooms as listed in Appendix L.*

As described in Chapters 4, 5, and Appendix B, there are known waste management disposition paths for all wastes that would be generated at LLNL.

This LLNL SW/SPEIS was prepared at a time when DOE/NNSA had developed proposals that were ripe for analyses in an EIS. Information pertaining to NNSA's planning and schedule for completing the LLNL SW/SPEIS is discussed in Chapter 1, Section 1.4.

DOE/NNSA believes a 10-year planning horizon is reasonable, especially given the requirement under the DOE NEPA regulations to evaluate site-wide documents every 5 years (see 10 CFR §1021.330 [d]). The 10-year planning assumption ensures that the LLNL SW/SPEIS looks at potential actions and alternatives that are both within and beyond the 5-year reevaluation. The LLNL SW/SPEIS contains analysis of impacts for the continued operations at LLNL for the duration of the planning horizon.

- 31.03** Commentor stated that the LLNL SW/SPEIS should be reviewed by an independent organization. Several commentors suggested that DOE should commit to a fixed schedule of revised EIS/Environment Impact Report reviews, not greater than every five years. The LLNL SW/SPEIS appears to be based on a number of “microreviews” of facilities, which are being expanded or modified. In addition, the LLNL SW/SPEIS does not have any documentation of a unitary decision linking the Proposed Action activities. This is needed to evaluate the nationwide and programmatic effects of the Proposed Action.

Commentor stated that the LLNL SW/SPEIS should clarify the relationship between each project’s final preferred alternatives; disclose impacts of reasonable scenarios that have not been addressed; and identify how decision-making for the respective the use of proposed materials on NIF in relation to the other decisions in the document. Commentor indicated that the LLNL SW/SPEIS does not distinguish each projects’ specific environmental impact.

Response: *The LLNL SW/SPEIS was distributed for review to anyone and any organization that requested a copy. As shown in Appendix K, many, if not most, of these reviewers are independent of the DOE/NNSA. Additionally, the EPA is statutorily required to review the LLNL SW/SPEIS, and did so. In accordance with DOE NEPA regulations, DOE evaluates every site-wide environmental impact statement at least every 5 years (see 10 CFR §1021.330[d]). The LLNL SW/SPEIS assesses the direct, indirect, and cumulative impacts of all proposed actions, reasonable alternatives, and connected actions.*

The LLNL SW/SPEIS distinguishes the specific impacts for the use of the proposed materials in NIF and the site-wide impacts of the proposed actions listed in Chapter 3. The specific impacts of using the proposed materials on NIF are identified in Appendix M. The site-wide impacts for the Proposed Action, including NIF’s use of the proposed materials, are identified for each of the resource areas in Chapter 5.

The decision as to which NNSA will take, will be announced through the issuance of a ROD. The ROD will state what decisions have been made and identify all alternatives considered by the agency in reaching these decisions, specifying the alternatives which were considered to be environmentally preferable. Additionally, the ROD may discuss preferences among alternatives based on relevant factors including economic and technical considerations and agency statutory missions. The ROD will also identify and discuss all such factors including any essential considerations of national policy, which

were considered by the agency in making these decisions and state how those considerations entered into its decisions.

- 31.04** Several commentors stated that the Draft LLNL SW/SPEIS is inadequate. Many of these commentors suggested that DOE revise and recirculate the LLNL SW/SPEIS as a draft.

Response: *Through the Final SW/SPEIS, NNSA is responding to public comments on the draft. As a result of these responses, changes have been made and are reflected in the Final SW/SPEIS. However, NNSA has identified no reason to recirculate another draft of the LLNL SW/SPEIS. The Draft LLNL SW/SPEIS was adequate and complies with all aspects of NEPA.*

- 31.05** Commentor contended that DOE is attempting to tier impact statements in a manner that is inconsistent with NEPA. The LLNL SW/SPEIS should analyze program level impacts, rather than site-wide impacts. Commentor stated that the SSM PEIS is outdated and cannot be given legal significance as a tiering document to contemporary impact studies. A commentor suggested that DOE provide a genuine assessment of the long-term cumulative and synergistic effects of these projects. Additionally, a commentor questioned Site 300 construction activities.

Response: *The LLNL SW/SPEIS assesses the direct, indirect, and cumulative impacts of all proposed actions, reasonable alternatives, and connected actions. These impacts occur at LLNL and within the region of influence. The document does not distinguish between “site-wide impacts” and “program level impacts.” As discussed in Comment Response 01.01 and 02.01, the SSM PEIS, which focuses on evaluating alternatives for maintaining the safety and reliability of the U.S. nuclear weapons stockpile without underground testing, remains valid today and provides a framework for the SSP and the LLNL site-specific proposals for the foreseeable future. Additional information regarding Site 300 construction activities is discussed in Comment Response 04.02.*

- 31.06** Some commentors disagreed with or suggested changes to the format and overall content of the LLNL SW/SPEIS. Commentors stated that DOE should include a comprehensive cross-referencing and indexing system. The table of contents for all the appendices should be available in Volume I and Summary. The LLNL SW/SPEIS should also be revised to read in layman’s terms. Another commentor found the language to be imprecise and undefined (e.g., minimal impacts, adverse). Impacts tended to be segmented into discrete categories, rather than considering synergistic effects. References to documents, such as previous EISs and technical appendices, are not readily available. The 2,000-page LLNL SW/SPEIS violates CEQ regulations stating that the Final LLNL SW/SPEIS shall be less than 300 pages. A commentor requested an internal NEPA review document from NNSA through a *Freedom of Information Act* (FOIA) request so that the alternatives can be meaningfully evaluated, and to determine whether the scope of the project and depth of the NEPA review was sufficient to protect the workers and public and environment. Commentor referred to a FOIA request related to TRU waste and its shipment to and from LLNL.

Commentor stated that the document has been written in discrete parts without the benefit of integration. The LLNL SW/SPEIS includes many sections that overlap. The assumptions made in each calculation should be listed. In numerous instances throughout the LLNL SW/SPEIS, data was published in truncated tabular form, but never appears anywhere in the text. Moreover, units should be used that are well known to laypeople and to the scientific community.

Commentor stated there is insufficient information (including D&D) in the Summary and Chapter 3 tables to allow the general public to discern the various impacts. Additionally, the tables should cross-reference to the various sections in the main document.

Commentor requested two documents under the FOIA and cannot adequately comment on the LLNL SW/SPEIS without reviewing these documents.

Commentors stated that the Department of Toxic Substances Control recently updated the Initial Study format and eliminated the Special Initial Study. Therefore, remove all text references in the LLNL SW/SPEIS to the word “special.”

Response: *The LLNL SW/SPEIS was written to conform to all legal requirements, including the following CEQ guidance (40 CFR §1502.10): “Agencies shall use a format for environmental impact statements which will encourage good analysis and clear presentation of the alternatives including the proposed action. The following standard format for environmental impact statements should be followed unless the agency determines that there is a compelling reason to do otherwise: (a) Cover sheet; (b) Summary; (c) Table of contents; (d) Purpose of and need for action; (e) Alternatives including proposed action (sections 102(2)(C)(iii) and 102(2)(E) of the Act); (f) Affected environment; (g) Environmental consequences (especially sections 102(2)(C)(i), (ii), (iv), and (v) of the Act); (h) List of preparers; (i) List of Agencies, Organizations, and persons to whom copies of the statement are sent; (j) Index; and (k) Appendices (if any).” DOE/NNSA understands that the primary subject of the LLNL SW/SPEIS (nuclear weapons research and development activities) is complex, and attempted to write the LLNL SW/SPEIS in plain language using appropriate graphics so that decisionmakers and the public could readily understand them. It should be understood, however, that the more complex the subject, the more difficult a task it is to write in “plain English,” while still maintaining scientific credibility. All unclassified references for the LLNL SW/SPEIS were made available in the reading rooms at LLNL and the Oakland Federal Building. NNSA fulfilled requests for additional access to reading rooms. In addition, copies of specific references were provided to individuals and organizations upon request. The references for LLNL SW/SPEIS include unclassified, classified, and “official use only” documents. In addition to those documents referenced, additional DOE, NNSA and LLNL documents were reviewed; however, they were not included in the references since no information from them was used in preparation of the LLNL SW/SPEIS. NNSA responds to FOIA requests separately from the NEPA process.*

With respect to the length of the document, the CEQ guidance (40 CFR §1502.7) states that final EISs shall normally be less than 300 pages for proposals that are of unusual

scope and complexity. The CEQ guidance regarding the length of an EIS only addresses the following sections of an EIS: (1) Purpose of and need for action; (2) Alternatives including proposed action (sections 102(2)(C)(iii) and 102(2)(E) of the Act); (3) Affected environment; and (4) Environmental consequences. This corresponds to Chapters 1 through 5 of the LLNL SW/SPEIS, which total approximately 600 pages. Given the complexity of the LLNL operations and that this document is a site-wide EIS as well as a supplemental PEIS, DOE believes that the LLNL SW/SPEIS is a reasonable length for the amount of material that DOE was required to cover. Additionally, the Summary of the LLNL SW/SPEIS is written to provide a concise document addressing the major impacts and major decisions to be made by NNSA.

Details regarding assumptions for a given calculation are generally found in the associated appendix for that resource or in a listed reference. Scientific units used in the LLNL SW/SPEIS are well known to the general public and to the scientific community.

- 31.07** Commentor stated that the LLNL SW/SPEIS should discuss EPA's multi-media inspection at LLNL, and address how EPA's findings and recommendations would be incorporated in the fully evaluated alternatives. In particular, the LLNL SW/SPEIS should evaluate how LLNL would address compliance with SPCC Plan regulations. If available, the findings and recommendations of other environmental compliance inspections at the Livermore Site and Site 300 since October 2002 should be reflected in the LLNL SW/SPEIS.

Response: *A discussion of the inspection is not required to identify the differences among the Proposed Action and the alternatives. DOE is committed to performing all operations in accordance with all applicable laws and regulations. According to recent amendments to 40 CFR §112.3, the SPCC Plan must be amended no later than February 16, 2006 and implemented by August 16, 2006. LLNL is in the process of reviewing and addressing all the comments and concerns raised as part of the multi-media inspection. This includes complying with requirements and updating the Livermore Site and Site 300 SPCC Plan. The current updates were originally promulgated in 2002 and amended in 2004. The implementation of the SPCC is applicable to all of the alternatives and would be implemented regardless of which alternatives are selected in the ROD.*

- 31.08** Commentor recommended having a representative from DOE headquarters at the public meetings. Commentors believed that it is inappropriate to have a DOE employee in charge of collecting public comments.

Response: *The comments are noted.*

- 31.09** Commentor questioned the categorical exclusion of the central cafeteria replacement. This cafeteria would be located near the drainage retention basin and could possibly impact populations of the California red-legged frog. The cafeteria also should be tested for trichloroethylene vapor intrusion. Commentor questioned the categorical exclusion of the International Security Research Facility. Construction of this facility could impact the environment. Commentor questioned the categorical exclusion of the Tritium Facility

Modernization Project. DOE should perform a NEPA evaluation of this facility and discuss the relationship between the activities between this facility and the Proposed Action. The LLNL SW/SPEIS should also explain the total budget and schedule for all activities associated with this project.

Other LLNL initiatives have been issued a FONSI: Terascale Simulation Facility, BSL-3 Facility, and security upgrades. These facilities should not be excluded from further NEPA review and all FONSIs should be reviewed in the LLNL SW/SPEIS.

Response: *According to DOE NEPA regulations (10 CFR Part 1021), actions that DOE has determined do not individually or cumulatively have a significant effect on the human environment can be categorically excluded from further NEPA action. All continuing operations are evaluated in the LLNL SW/SPEIS as discussed in Chapter 3, Section 3.2. Budget and schedule information is provided in Comment Response 03.02. The cafeteria and the International Security Research Facility are operational. The Terascale Simulation Facility, BSL-3 Facility, and the security upgrades are nearly complete. The Tritium Facility Modernization Project is still in the planning process. Each of these projects was analyzed under an environmental evaluation or addressed through a categorical exclusion and analyzed as part of the No Action Alternative.*

- 31.10** Commentor suggested that DOE/NNSA incorporate aspects of the “precautionary principle” into the LLNL SW/SPEIS and use it as a decision-making tool.

Response: *DOE/NNSA complied with all applicable laws, regulations, and guidance regarding the preparation of the LLNL SW/SPEIS. NNSA considers the No Action Alternative to be consistent with the precautionary principle because it represents a level of operation consistent with past operations at LLNL.*

32 OUTSIDE THE SCOPE OF THE LLNL SW/SPEIS

- 32.01** Commentor expressed concern regarding the energy crisis in California and suggested that residents take actions to reduce energy consumption. Commentor stated that the LLNL SW/SPEIS should be compliant with the *California Environmental Quality Act* (CEQA).

Response: *DOE has a formal energy conservation program at LLNL. CEQA does not apply since this LLNL SW/SPEIS does not invoke a decision by a state agency. The Notice of Intent was distributed to Federal, state, and local government agencies, and tribes requesting comments on the alternatives and offering the opportunity to be a cooperating agency. No requests to be a cooperating agency were received, however, the California Department of Toxic Substances Control requested that Appendix B be formatted in a manner that would be beneficial in their consideration of future permit requests from LLNL.*

- 32.02** Commentor stated that DOE should analyze the potential use of nuclear weapons. Commentor suggested that DOE eliminate all nuclear arms. Commentor submitted a

petition dated July 17, 1945, to the President of the U.S. opposing the use of atomic bombs in war with Japan. Commentor is opposed to war.

Response: *The policy for the use or elimination of nuclear weapons is beyond the scope of this LLNL SW/SPEIS. NNSA programs and operations comply with the United States nuclear weapons policy developed by the President and legislated by Congress.*

- 32.03** Commentor stated that all government employees should consider how they are being used to support an imperial power that is oppressing the world. Commentor is opposed to launching armed satellites into space. The *Preservation of Space Act* (H.R. 3657) prohibits putting weapons into space and provides international treaties to ban space weapons. Commentor questioned the financial benefits LLNL receives through management by the University of California. Commentors suggested DOE provide a master plan and timeline for the transfer of activities from Lawrence Berkeley National Laboratory (LBNL) to LLNL. Commentor was concerned about the groundwater at Lawrence Berkeley National Laboratory and the Lawrence Hall of Science. Another commentor questioned why the University of California is exempt from paying state taxes.

Response: *These comments are beyond the scope of the LLNL SW/SPEIS.*

- 32.04** Commentors expressed disagreement with nuclear weapon policies and NNSA operations at LLNL based on religious and personal convictions.

Response: *These comments are beyond the scope of the LLNL SW/SPEIS. For additional information on nuclear weapon policies, see Comment Response 02.01.*

- 32.05** Commentors expressed a lack of confidence in the management at LLNL.

Response: *LLNL is managed in accordance with all applicable Federal, state, and local laws.*

33 PLUTONIUM LIMITS

- 33.01** Commentors expressed opposition to increasing the administrative limit for plutonium at LLNL. The administrative limit should decrease, not increase; or plutonium should be completely deinventoried at LLNL. Commentors stated that increasing the administrative limit is dangerous and alarming, a threat to the health and safety of the local population, and encourages nuclear proliferation. Plutonium cannot be stored safely at LLNL.

Commentor questioned how the limit for plutonium can be increased when there is no disposition pathway material and waste. Commentor requested a description of initiatives to dispose of plutonium, including the potential risks for the initiatives. Please indicate the forms in which the plutonium will be stored, types of storage containers, and duration of storage. Would plutonium administrative limits be reduced back to current levels

when appropriate disposal has been identified and implemented? Would it be possible for plutonium to be stored at the Savannah River Site?

Commentor requested that DOE cite the specific changes in the purpose and need for the SSP that were not anticipated in the 1999 or 1997 Supplement Analysis and the amount of plutonium that would be required for each. Cite specific alternatives for each of the changes.

Commentor questioned the increase in plutonium in relation to the history of criticality violations and releases of plutonium. Another commentor requested an analysis be completed for storage of plutonium for the next 50 to 75 years.

Commentors expressed concern about an increase in plutonium MAR from 20 kilograms to 60 kilograms. Commentors stated that it is unsafe, an environmental threat to the people of California, a risk to health, would increase air pollution, increase exposure, and would increase generation of TRU waste. Commentors believed that the plutonium MAR decreased. A commentor also stated that the hazards are inadequately examined in the LLNL SW/SPEIS. Commentors suggested that the accident analysis be redone. Commentors believe that there is no justification for increasing radiation risks by increasing MAR limits.

Response: *NNSA continues to rely on LLNL to meet its SSP mission objectives. These objectives include campaigns relating to pit manufacturing and certification, advanced radiography, dynamic materials testing, materials shelf-life experiments, and enhanced surveillance research, which contribute to the need for long-term storage of plutonium. These NNSA-assigned campaigns and programs require increasing the use of plutonium. NNSA continues to work on a solution for disposal of plutonium, but no pathway for LLNL to dispose of excess plutonium currently exists, requiring an increase in the plutonium administrative limits. It would be speculative to consider if plutonium administrative limits could be reduced in the future. The Proposed Action as defined in Chapter 3 for the LLNL SW/SPEIS includes proposals that were not previously considered in the SSM PEIS or other NEPA documents.*

NNSA has reconsidered its requirements and determined that there is no reasonably foreseeable need to pursue either the AMP or ITP. Therefore, the AMP has been removed from the No Action Alternative and ITP has been removed from the Proposed Action. Changes have been made in Chapter 1, Sections 1.5.2, 1.5.3, and 1.5.4 and Chapter 3, Sections 3.3.2, 3.3.3, and 3.3.4 in the Proposed Action. These revisions include changing the proposed increase in the administrative limit for plutonium to 1,400 kilograms (compared to 1,500 kilograms in the Draft LLNL SW/SPEIS) and changing the proposed increase in the MAR limit to 40 kilograms (compared to 60 kilograms in the Draft LLNL SW/SPEIS).

Chapter 5, Sections 5.2.14.2, 5.3.14.2, and 5.4.14.2, discuss radiological health impacts for the alternatives. There would be no significant impact to the public or the environment from storing 1,400 kilograms of plutonium. As stated in Chapter 1, Section

1.5.2, the Superblock plutonium inventory is stored in robust vaults and no accident scenario involving the material in the vaults is considered reasonably foreseeable. Plutonium would be stored as metal and oxide, and as various isotopes and compounds. It will be stored in various types of containers. These containers and the vault would permit indefinite storage of the material.

In the case of a MAR increase from 20 kilograms to 40 kilograms, the LLNL SW/SPEIS evaluates potential impacts to workers and the public from normal operations and accidents. Consequences from an accident were analyzed and are presented in Appendix D, Section D.2.4.9. These consequences are small for an accident expected to occur less than once in a million years.

The probability and consequences of a criticality accident is discussed in Appendix D, Section D.2.4.1. This probability was developed based on historical data for criticality accidents.

Terrorist acts and Superblock security are discussed in Comment Response 30.01. The information on these acts is provided in classified or official use only documents.

Savannah River Site operations, including storage of material from LLNL, are outside the scope of this document.

LLNL has a maintenance and storage program that continually inventories and assures the safe storage of plutonium. Excess plutonium has been packaged for long-term storage according to DNFSB Recommendation 94-1.

The nuclear nonproliferation issue is addressed in Comment Response 01.01. Information on the purpose and need for SSP operations is covered in Comment Response 02.01.

34 TRITIUM LIMITS

34.01 Many commentors expressed concern and opposition regarding the manufacture of tritium targets for the NIF. This would increase the amount of airborne radioactivity emanating from LLNL. There was also concern that the tritium used in the Tritium Facility would increase from the current limit of just over 3 grams to 30 grams. Commentors objected to increasing the tritium MAR because of damage to the environment and an increase in nuclear proliferation. Tritium target fabrication presents many unstudied risks and should be given a more substantial treatment in the LLNL SW/SPEIS.

Commentor expressed concern regarding the increase in administrative limits for tritium. Commentor is concerned that tritium cannot be safely stored at LLNL because of past tritium releases at LLNL. Tritium contamination has harmful biological effects and environments around LLNL have been contaminated. Many commentors believed that the tritium administrative limit should be decreased. The LLNL SW/SPEIS should

catalog historical tritium releases from LLNL, provide local tritium concentrations, and mitigations to protect against future releases. LLNL should consider reducing or deinventorying tritium at LLNL. Commentor asks for a discussion of tritium in LLNL waste, releases to sewage, soil, and groundwater.

Response: *As noted in Chapter 1, Section 1.5.5 and Chapter 3, Section 3.3.5, LLNL has been assigned responsibility to support future planned SSP activities such as the high-energy density physics target fill and the Test Readiness Program. These activities require the use of 30 grams of tritium at LLNL. Tritium would be stored in robust containers in accordance with all applicable Federal, state, and local laws and regulations.*

LLNL has historically released tritium to the air during routine operations and, occasionally, by accident. Chapter 4, Figure 4.10.5–1, lists the history of tritium emissions from the Tritium Facility from 1981 to 2002. Chapter 5, Section 5.6 discusses mitigation measures.

Under normal operations, Chapter 5, Section 5.2 notes that it is anticipated that tritium impacts on vegetation and wine might increase slightly as Tritium Facility activities at the Livermore Site would increase. Tritium emissions would increase from approximately 30 curies in 2002 to 210 curies per year for the Proposed Action. In addition, Site 300 and NIF would use tritium under the No Action Alternative. For further discussion of tritium releases, see Comment Responses 16.01 and 17.02.

Tritium in surface and drinking waters is discussed in Section 4.11.1, tritium in stormwater in Section 4.11.2, tritium in groundwater in Section 4.11.3.4, tritium contamination at Site 300 in Section 4.11.3.4. Tritium in wastewater is discussed in Section 4.14.4. The impact of tritium is discussed extensively throughout Section 4.17. Tritium levels in vegetation and commodities are also discussed beginning in Section 5.2.7.2 and Section 5.2.8.2. Tritium contamination is discussed in Sections 5.2.9 and 5.2.15. Tritium in waste is discussed in Section 4.15.2.2.

Analysis in the LLNL SW/SPEIS shows the increased tritium MAR would result in higher consequences from an aircraft crash into the Tritium Facility. This accident is unlikely (annual occurrence frequency of 1.53×10^{-6}) and would result in lower consequences (i.e., a lower number of LCFs) and is not the bounding radiological accident under any alternative. The increased likelihood of a LCF for the population surrounding LLNL is 1.1×10^{-1} LCFs and onsite workers is 1.44×10^{-1} LCFs (Appendix D, Table D.2.5–2).

The nuclear nonproliferation issue is addressed in Comment Response 01.01. Human health effects from tritium are discussed in Comment Response 23.02.

35 BIOSAFETY LEVEL-3 FACILITY

35.01 Commentors opposed collocating an advanced “bio-warfare agent facility” with nuclear weapons activities in a classified area at LLNL. Commentors stated that DOE proposed

genetic modification and aerosolization (spraying) with live anthrax, plague, and other deadly pathogens could weaken the international biological weapons treaty and pose a risk to workers, the public, and the environment in the Bay Area. The LLNL SW/SPEIS does not adequately describe the unique security issues. Also, the LLNL SW/SPEIS fails to give alternative sites and does not provide the purpose and need for the BSL-3 Facility at LLNL.

Commentor questioned if infectious materials, biotoxins, or pharmaceuticals from the BSL-3 Facility would have potential to impact groundwater. Commentor questioned how the biological agents will be transported and disposed of at LLNL.

Commentors questioned how the BSL-3 Facility can be included in the No Action Alternative when there is pending litigation against the use of “dangerous pathogens” and a current judicial order prohibiting their importation pending resolution of the litigation.

Some commentors requested that the “precautionary principle” be applied to BSL-3 Facility operations. Commentors attached detailed comments from 2002 that were submitted in response to the BSL-3 EA.

Response: *The BSL-3 Facility would not be used for developing bio-warfare agents. The United States is a signatory to the Biological and Toxin Weapons Convention Treaty, which prohibits bio-weapons development. This BSL-3 Facility would develop DNA signatures to rapidly identify deadly agents that can be used to protect the public in response to a bio-terrorism incident. The BSL-3 Facility operation does not combine biological research with nuclear weapons activities. No radioisotopes would be used in the BSL-3 Facility. Genetic modification activities would be used for studying how to weaken an agent, not to make it more robust.*

Samples could be shipped to LLNL by commercial package delivery services, the U.S. Postal Service, other authorized entity, or delivered to the receiving area from an origination point within LLNL by a designated LLNL employee acting as a courier (39 CFR Part 111; 42 CFR Part 73; 49 CFR Part 171). Smaller samples could be shipped that would be microliters in size; the maximum possible sample size would be 15 milliliters. All incoming packages (regardless of origination point) containing infectious agents would be packaged in DOT-approved packages (42 CFR Part 73). Transportation and interstate shipment of biomedical materials and import of select agents would be subject to the requirements of the U.S. Public Health Service Foreign Quarantine (42 CFR Part 71), the Public Health Service, and DOT regulations. Additionally, the U.S. Department of Agriculture regulates the importation and interstate shipment of animal or plant pathogens (7 CFR Part 330; 9 CFR Part 121; and 9 CFR Part 122). Biological wastes would be treated and disposed of in accordance with the Centers for Disease Control and National Institutes of Health guidance, and other applicable Federal, state, and local regulations. This facility would be included in the LLNL medical waste treatment permit issued by the State of California and overseen by the Alameda County Department of Public Health.

An Environmental Assessment provides NEPA coverage for the construction and operation of this facility. The EA presented purpose and need, alternative sites, and environmental impacts including groundwater. Any comments received in 2002 were addressed in the BSL-3 EA. A FONSI (DOE/EA-1442), dated December 16, 2002, was issued for the BSL-3 Facility at LLNL. The No Action Alternative includes all projects for which there is approved NEPA coverage and that includes the BSL-3 Facility. This facility was the subject of litigation. On September 10, 2004 the United States District Court for the Northern District of California issued an Order stating that DOE's EA (DOE/EA-1442) was not arbitrary or capricious and found the EA to be adequate. Tri-Valley CAREs v. United States Department of Energy, No. C03-3926 (SBA). No further NEPA analysis is required prior to commencing BSL-3 Facility operations.

For international biological treaty issues, see Comment Response 01.02.

For comments relating to terrorist attacks, see Comment Response 30.01.

For information on the precautionary principle, see Comment Response 31.10.

36 LAWRENCE BERKELEY NATIONAL LABORATORY WASTE DRUMS

36.01 Commentor expressed concern and opposition regarding LBNL waste drums. Commentor requested more detail concerning shipments, including what roads will be used; how often shipments would occur; would local residents be notified; would shipments occur during peak or off-peak hours; are shipments secured from a terrorist attack; and how will these shipments be protected in transit through densely populated urban areas. No analysis of the environmental or human health risks involved with inspection analysis, loading, transport, unloading, and storage are provided in the LLNL SW/SPEIS. Commentors questioned the content, location, source, and type of radioactivity and hazardous material, and disposal locations of the LBNL waste drums. The LLNL SW/SPEIS should provide necessary permits and associated packaging and shipping requirements. Commentors were concerned about past shipments of waste from LBNL to Hanford.

Response: *The Proposed Action has been reduced from 14 drums of low activity TRU and mixed TRU waste to five drums of mixed TRU waste from LBNL to LLNL for characterization and ultimate disposal at WIPP. This change is stated in Chapter 3, Section 3.3.16, and Appendix A, Section A.2.4.14. The LBNL waste drums are currently located at LBNL in Building 85 and would be transported through the Interstate 580 corridor to LLNL for characterization and shipment to WIPP. All liquid corrosive and non corrosive mixed TRU waste would be neutralized and solidified before shipment to LLNL. The total volume of the mixed TRU waste is approximately 77 liters with a total activity (all isotopes) of approximately 120 millicurie. The type of radioactivity and hazardous material in the LBNL waste drums is mixed TRU waste that meets the definition of mixed TRU waste in Appendix B, Section B.1.1. This single shipment would be in accordance with DOT requirements and would be coordinated with the State of California. Appendices B and J provide information concerning permits and regulations.*

The environmental impacts from this shipment are presented in Appendix J, Section J.6.1. The analysis in Appendix J assumes a radiation dose rate of 4 millirems per hour for all waste shipments including the shipment between LBNL and LLNL.

The operations at LBNL, including possible shipments to Hanford, are not within the scope of the LLNL SW/SPEIS. For additional information on routes and security see Comment Responses 20.01 and 30.01.

37 DEVELOPING NEW TECHNOLOGIES FOR PLUTONIUM PIT MANUFACTURING

- 37.01** Many commentors indicated opposition to the proposed plan to test new manufacturing technologies for producing plutonium pits for nuclear weapons and recommended the stoppage of funding to this project. Commentors asked for a more detailed description to allow the public to analyze its hazards and proposed alternatives. The LLNL SW/SPEIS should discuss the relationship between these new technologies proposed at LLNL and the operation of DOE's proposed Modern Pit Facility (MPF). A commentor asked how many prototype pits or hemi-shells are going to be manufactured under this proposed action. An explanation as to why LLNL was chosen for the development of new technologies for manufacturing plutonium pits should be provided in the LLNL SW/SPEIS. Commentors stated that production of bomb cores would have grave safety, risk to the community, proliferation, and environmental consequences such as increasing the amount of airborne radioactivity.

Commentors also requested an analysis of past pit development at the Rocky Flats Plant. Commentors expressed concern about past health effects at the Rocky Flats Plant. Commentors questioned the need for the development for new pit manufacturing techniques because the United States could take older warheads out of the stockpile, thus lowering the average age of the stockpile and obviating the need for new pits. The LLNL SW/SPEIS fails to adequately discuss LANL's current plutonium pit manufacturing capabilities.

Commentors asked for an explanation of the relationship between SSP and technology development for pit manufacturing.

A commentor questioned the need to produce additional pits given the fact that the United States is "awash in pits."

Response: *As noted in Chapter 3, Section 3.1, NNSA continues to rely on LLNL to meet its SSP mission objectives. These objectives include campaigns relating to pit manufacturing and certification, advanced radiography, dynamic materials testing, materials shelf life experiments, and enhanced surveillance research.*

The proposal to increase the plutonium MAR has been revised from 60 kilograms to 40 kilograms, recognizing the removal of ITP from the Proposed Action. A MAR of 40 kilograms is required to support future Stockpile Stewardship Programs such as the casting of plutonium parts in (one or two rooms) in the Plutonium Facility. These activities support campaigns for advanced radiography, pit manufacturing, and

certification programs. The LLNL SW/SPEIS has been updated for this change including the accident analysis in Appendix D, Section D.2.4.9 and is identified as a bounding accident for nuclear material handling in Chapter 5, Section 5.5.1.2. Additional information has been added to the Summary and Chapter 3 pertaining to plutonium casting in the Plutonium Facility.

LLNL is one of only two plutonium research facilities in the United States. Given the significant amount of work underway at the LLNL Plutonium Facility, NNSA chose LLNL to conduct some of the technology development efforts to support pit manufacturing. Actual production of pits would take place at another site.

Regardless of a decision concerning the MPF, NNSA has identified the need to develop advanced plutonium casting techniques at LLNL. Decisions regarding a MPF and issues concerning the safety and past operations of the Rocky Flats Plant are not within the scope of the LLNL SW/SPEIS. Commentors seeking more information regarding the MPF are directed to the Draft Supplemental Programmatic Environmental Impact Statement on Stockpile Stewardship and Management for a Modern Pit Facility (DOE/EIS-236-S2).

38 CONTAINER SECURITY TESTING FACILITY

- 38.01** Commentor questioned the use of a categorical exclusion to satisfy the NEPA requirement for the Container Security Testing Facility. Testing could possibly cause container breach, therefore accidental release of emissions exists. Possible risk to human health and the environment from actual or simulated threat materials should be discussed in the LLNL SW/SPEIS. The Container Security Testing Facility should be described more thoroughly in the LLNL SW/SPEIS.

Response: *According to DOE NEPA regulations (10 CFR Part 1021), actions that DOE has determined do not individually or cumulatively have a significant effect on the human environment are categorically excluded from further NEPA action. All operations are evaluated in the LLNL SW/SPEIS, as discussed in Chapter 3, Section 3.2. The Container Security Testing Facility is described in detail in Appendix A, Section A.2.3.5, with considerable supporting detail in Appendix A, Section A.2.2.51. Further detail on the hazards associated with the operation of this facility are detailed in reference DOE 2003a.*

39 PREPARATION FOR TEST READINESS

- 39.01** Many commentors expressed opposition to the proposal to develop diagnostics to “enhance” the Nation’s readiness to conduct full-scale underground nuclear tests. Commentors opposed this over concerns for nuclear proliferation and over the impact on ratifying the Comprehensive Test Ban Treaty. Commentors also opposed Enhanced Test Readiness because they claim it is terrible for the environment, the American geopolitical strategy, and because it is a danger to health and world peace. The LLNL SW/SPEIS does not provide decisionmakers and public with sufficient information to comment on the impacts, alternatives, and potential mitigation measures associated with this project.

A commentor questioned if DOE had public outreach in Nevada and Utah as part of the test readiness program.

Response: *In response to a 1993 Presidential directive, NNSA was required to maintain the ability to conduct a full scale underground nuclear test at the NTS within 24-36 months of receiving direction from the President to do so. Recently, Congress has directed NNSA to achieve, by October 1, 2006, a readiness posture of not more than 18 months for the potential resumption of underground nuclear testing of nuclear weapons, if the President directs (and Congress approves) a resumption of such testing. The element of the Enhanced Test Readiness Program assigned to LLNL with potential local environmental impacts includes providing diagnostic systems for nuclear testing, which contain tritium. The proposed higher tritium limits are required in order to fabricate these systems. Though LLNL has been assigned other responsibilities supporting Enhanced Test Readiness, they are planning and engineering functions carried out by the existing LLNL workforce.*

The nuclear nonproliferation issue is addressed in Comment Response 01.01.

The proposed higher tritium limits are addressed in Comment Response 24.01.

The issue of recirculating the Draft LLNL SW/SWEIS for public comment is addressed in Comment Response 31.04.

DOE did not conduct public outreach in Nevada and Utah in connection with the LLNL SW/SPEIS because the focus of this site-wide EIS is LLNL in California. The site-wide EIS for the NTS, DOE/EIS-0243 (issued November 1996) along with its Supplement Analysis, DOE/EIS-0243-SA01 (2002), were the NEPA documents where public outreach in Nevada and Utah was conducted.